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Female Athletes And Performance-Enhancer Usage

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FEMALE ATHLETES AND PERFORMANCE-ENHANCER USAGE

BY

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DEDICATION

This paper is dedicated to Dr. Genevieve Pinto-Zipp, who has been a professional and personal inspiration to me. Thank you Dr. Zipp for your support and encouragement, without which I would not be where I am today.

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ABSTRACT

FEMALE ATHLETES AND PERFORMANCE-ENHANCER USAGE

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Problem: Currently there is no evidence-based research on the importance of potential factors (i.e., peer pressure, pressure to win, etc.) leading to performance-enhancer usage among female athletes at the high school level. The purpose of this study was to develop a knowledge base on factors associated with performance-enhancer usage among this population in order to identify markers for a future prevention-education program.

Methods: The study used a pretest-only between-subjects, Likert Scale survey design to rank the importance of certain internal and external pressures that may lead to performance-enhancer usage among female athletes at the high school level. Subjects included 122 female athletes from top-ranked sport programs at 7 New Jersey high schools. Descriptive and quantitative statistics were used to analyze the data at a $p \leq .05$ significance level. The Chi Square Test of Homogeneity, Spearman Correlation Coefficient, Kruskal-Wallis One-Way ANOVA, and Scheffé Post-Hoc Test were used to analyze associations between the nine survey issues and five levels of importance.

Results: Descriptive statistics indicated that subjects rated the pressure to win and self-induced competitive pressures as the two most important factors in leading to performance-enhancer usage. Chi-Square results showed significant differences in the level of importance for each of the nine issues presented to the female athletes, while the Spearman Correlation revealed several correlations among certain issues. The Kruskal-Wallis One-Way ANOVA showed significant differences in ranks when data were grouped by school and sport. Post-Hoc analysis supported findings of the Kruskal-Wallis One-Way ANOVA.

Conclusions: This study provided descriptive and quantitative data that added to the existing research. The findings may be used by health educators and athletic coaches for performance-enhancer prevention-education programs.

Chapter I

INTRODUCTION

Background of the Problem

Performance-enhancer abuse is growing rapidly among young women (Donatelle, 2002; NIDA, 2000). The explosion of professional female sports is giving young women of all ages more opportunity to compete at higher levels. This increased opportunity is leading to greater pressure to win, which may be contributing to performance-enhancer usage among female athletes as young as 12 years of age (Metzl et al., 2001; Yesalis & Bahrke, 2000). Because of the growing number of young women using performance-enhancers, it is important for health educators to understand what these substances are, how they work, the potential side effects, and the factors contributing to usage among this population.

Performance-enhancers are ergogenic drugs used to provide an additional physical "edge" for an athlete engaging in competition (Donatelle, 2002). This class of drugs (i.e., anabolic steroids, amphetamines, cocaine, etc.) is known to produce harmful physiological and psychological effects, including loss of hair, sterility, outbursts of rage, liver damage and heart complications (Donatelle, 2002; Insel & Roth, 2000). Despite the dangerous side effects associated with performance-enhancer usage, athletes continue to use a

variety of ergogenic aids. Amphetamines, cocaine, caffeine, Human Growth Hormone, certain over-the-counter nutritional substances that do not require FDA approval, and anabolic androgenic steroids (AAS), are used by many athletes to either increase energy level or gain muscle mass (Smith & Perry, 1992; Millman & Ross, 2003). Although legal usage of steroids and other performance-enhancers in the U.S.A. is only permissible for medical purposes through physician prescription, many athletes are illegally obtaining and taking large dosages of these substances (Donatelle, 2002).

Current research shows that female athletes across competitive levels are using performance-enhancers to improve both their athletic performance and appearance (Metzl et al., 2001; Johnson, 1990; Pecci & Lombardo, 2000). Specifically, these studies indicate that at the high school level, increasing numbers of female athletes are taking steroids and nutritional supplements (Luetkemeier et al., 1995; Tyler, Lauver, & Zitans, 1991; Bahrke et al., 1998; Terney & McLain, 1990), with prevalence rates in grades 11 and 12 approaching levels equal to collegiate athletes (Metzl et al., 2001). While these and other studies present statistical information on the rate of performance-enhancer usage among female athletes at various ages and competitive levels, there is no information on the potential factors (i.e., peer pressure, pressure to win, coaching pressure, etc.) leading to usage among this population.

Statement of the Problem (Purpose of the Study)

In order to make informed decisions about the use of steroids and other performance-enhancing drugs, female athletes need to recognize the factors leading to usage and the dangerous side effects that may occur. While most health educators teach adolescents about the risks associated with steroid/ performance-enhancers, educators must also address the reasons underlying usage. To date, no published studies have examined the psychological or emotional factors (i.e., peer pressure, pressure to win, coaching pressure, etc.) underlying the reported increase in performance-enhancer usage among young women athletes. Identifying these factors would establish markers that could be used to develop a prevention-education program. Therefore, the purpose of this study was to identify factors associated with performance-enhancer usage among high school female athletes. It is anticipated that the information obtained would help health educators and coaches to design educational programs that can assist young women in making informed decisions about performance-enhancer use.

Hypothesis

Coaching pressures, peer pressure and self-induced competitive pressure to win will be the factors most strongly associated with performance-enhancer usage among high school female athletes.

Need

Although steroid abuse is more prevalent among males than females, it is growing most rapidly among young women (NIDA, 2000). Consequently there is an immediate need to identify the reasons behind the sharp increase in usage.

Most of the current information on the effects of steroids and other performance-enhancing drugs on female athletes is found in the popular literature, rather than the professional literature. Moreover, this information does not address the issues specific to usage among female athletes, but focuses on the prevalence of usage by both male and female high school athletes. Further, none of the writings have applied theoretical models of behavior change to the development of prevention-education programs to target performance-enhancer usage among high school female athletes.

Because the popular media bombards the general public with information on "quick fixes" and the latest nutrition or supplement craze, it is difficult for young student-athletes to distinguish between fact and fiction. Therefore, student-athletes turn to health educators and coaches for information regarding nutrition and supplementation with the expectation that this will enable them to perform at a highly competitive level. A need exists to move the issue of performance-enhancer usage from the popular literature to the professional literature and into the educational arena.

This study will pioneer a new line of inquiry into the internal and external determinants of performance-enhancer usage among high school female athletes, while also contributing to the existing knowledge base on steroid and performance-enhancer abuse. More importantly, the findings may help health educators and coaches in counseling and educating female athletes who seek their advice regarding the risks and benefits of performance-enhancer usage. The health educator or coach may be able to address the perceptions or issues behind the athlete's desire to engage in usage rather than simply provide information on the dangers of using certain performance-enhancers.

Chapter II

REVIEW OF LITERATURE

Overview of Literature Review

This literature review will focus on two areas of research related to performance-enhancer usage among female athletes, 1) explanation of the methods of usage of steroids/performance-enhancers and resulting medical outcomes and 2) prevalence of performance-enhancer usage among adolescent, collegiate, and professional female athletes. A new and alarming trend among female athletes is the use of steroids and other drugs that achieve performance-enhancing effects. In women, large doses of anabolic steroids may trigger the development of masculine characteristics such as lowered voice, increased facial and body hair, decreased breast size, and changes in or absence of menstruation (Donatelle, 2002). More serious side effects include permanent damage to the cardiovascular, reproductive, hepatic, and nervous systems (Hartgens & Kuipers, 2004). For this reason steroids are banned by law except when prescribed by a physician for the treatment of specific diseases (Donatelle).

Steroid alternatives are now being sought by many athletes in order to avoid the stiff penalties levied against those who use anabolic steroids without a valid prescription (Donatelle, 2002). Other muscle-building

supplements, such as creatine, are also being used by athletes to build muscle mass (Donatelle). While these alternative supplements are legal and easily accessible (Bohn et al., 2002), questions remain concerning the safety of their usage (Donatelle). As a result, young female athletes are taking these over-the-counter supplements without knowing the long-term side effects. To date, there is no research that deals specifically with the possible internal and external determinants leading to performance-enhancer usage among high school female athletes. Thus, professional literature related to the prevalence of performance-enhancer usage among female athletes at the high school, college, and professional levels forms the basis of this review.

In order for health educators and coaches to effectively counsel their athletes about the dangers of performance-enhancer usage, they must first be aware of the medical background and effects of performance-enhancers and the broad range of usage at all competitive levels. They must also understand the issues and pressures faced by female athletes. By understanding some of the psychosocial dynamics and internal/external pressures on female athletes, health educators and coaches can develop and implement prevention-education programs that address these pressures and emphasize healthy coping strategies, which may deter further engagement in usage.

Methods of Usage and Mechanisms of Action of Anabolic Steroids

Anabolic steroids may be taken orally or by intramuscular injection (Anderson & Bolduc, 1997; Smith & Perry, 1992). Oxymetholone (Anadrol), oxandrolone (Anavar), methandrostenolone (Dianabol), and stanozolol (Winstrol) are orally administered steroids, while nandrolone decanoate (Deca-Durabolin), nandrolone phenpropionate (Durabolin), testosterone cypionate (Depo-Testosterone), and boldenone undecyclenate (Equipoise) are administered by injection (Anderson & Bolduc). A typical steroid cycle lasts 6 to 12 weeks, with individuals often using a combination of oral and injectable drugs during this time. Although most steroid users prefer the injectable drugs because they are less hepatotoxic, those who undergo frequent drug testing take the oral forms that clear more rapidly from the body to escape detection (Anderson & Bolduc).

"Stacking" is a term used by many steroid users to describe the practice of using many steroid preparations at one time. As one continues to increase the steroid dosage during a cycle, he/she is said to be "pyramiding", or consuming steroid doses that may be anywhere from 10 to 40 times greater than the amount typically prescribed for medical purposes (Anderson & Bolduc, 1997).

Anabolic steroids produce a reaction in the body at the cellular level by binding to androgen receptors to stimulate the production of RNA, which

increases protein synthesis (Anderson & Bolduc, 1997). Because identical androgen receptors are found throughout the body in various muscles and organs, the clinical effect produced is largely determined by the type of receptor bound to the steroid, the organ containing the receptor, and the steroid metabolism associated with that organ (Anderson & Bolduc; Haupt & Rovere, 1984; Lamb, 1984). Many steroids have been shown to have an anticatabolic effect, as the steroid metabolism of a particular organ can be inhibited, thereby increasing protein utilization. More protein is associated with increased muscle mass, which can lead to strength gains. Psychological effects associated with steroid consumption (i.e., increased aggressiveness, euphoria, decreased sense of fatigue) may result in strength gains as well, as the individual may be able to participate in longer and more intense training sessions (Anderson & Bolduc).

Adverse Side Effects Associated with Anabolic Steroid Use

Many adverse and even fatal side effects can result from anabolic steroid usage. Although severe liver or hepatic system damage is rare, steroids commonly increase liver enzyme levels, which can lead to more damage if usage is prolonged (Anderson & Bolduc, 1997). In men, sterility is possible, as steroid use leads to decreased endogenous testosterone production, decreased spermatogenesis, and testicular atrophy. In women, masculinizing effects such as hirsutism, acne, deepening of the voice, clitoral hypertrophy, and male-pattern baldness can occur and may be irreversible. In both

genders, thrombotic damage from steroid use may precipitate stroke, myocardial infarction, and limb loss (Anderson & Bolduc).

Anabolic steroid users may also exhibit changes in mental and behavioral states. Irritability, aggressiveness, euphoria, depression mood swings, altered libido, and even psychosis are some of the reported side effects (Anderson & Bolduc, 1997; Bahrke, Yesalis, & Wright, 1990). Gruber and Pope assessed the psychiatric status of female athletes attending gyms. Of the women who had a history of AAS abuse, the researchers observed a number of mental abnormalities, including polysubstance dependence, hypomanic symptoms, depressive symptoms during withdrawal, rigid dietary practices, non-traditional gender roles and chronic dissatisfaction and preoccupation with their physiques (Gruber & Pope, 2000; Hartgens & Kuipers, 2004).

In assessing personality characteristics of adolescent athlete steroid users, Burnett and Kleiman (1994) found that steroid users had significantly high levels of forcefulness and impulsiveness and low levels of cooperativeness. Also, upon assessment of mood states among steroid users currently and not currently on a steroid cycle, Burnett and Kleiman found that those users who were taking steroids during the study had significantly higher levels of depression, anger, vigor, and total mood disturbance than did steroid users who were not on steroids at the time of study (Burnett & Kleiman). Mood swings also are common when one stops

using steroids, as anabolic steroid withdrawal and dependency disorders can result. Anxiety, irritability, insomnia, hot flashes, sweats, chills, anorexia, myalgia, nausea, vomiting, piloerection, tachycardia, hypertension, and depression are some of the symptoms associated with acute anabolic steroid withdrawal (Anderson & Bolduc, 1997; Kashkin & Kleber, 1989).

Reproductive System Effects

AAS can also affect sex hormones and the reproductive system. As previously stated, in males, AAS use will disturb the endogenous production of testosterone and gonadotrophins, leading to possible sterility (Hartgens & Kuipers, 2004). Much less is known on the effects of AAS in females. What is known is that the use of AAS will induce masculinization in women. Side effects reported by female bodybuilders include the development of acne vulgaris, changes in libido and alterations of the voice in the short term, and menstrual irregularities and a reduction of breast size over the long term (Hartgens & Kuipers).

Cardiovascular System Effects

Abuse of AAS is also associated with many serious cardiac effects, including cardiomyopathy, atrial fibrillation, QT dispersion, stroke, myocardial infarction, disturbances of the haemostatic system, ventricular thrombosis and systemic embolism, acute heart failure, and cardiac sudden death (Hartgens & Kuipers, 2004). Although there may be other external factors, in addition

to AAS abuse that contribute to the development of cardiovascular effects, the role of AAS abuse cannot be ignored (Hartgens & Kuipers).

Hepatic Effects

Several animal studies indicate that liver function disturbances can occur with AAS usage. Therefore, there is concern that AAS abuse in humans will also lead to liver disease. Serious liver disorders such as subcellular changes of hepatocytes, impaired excretion function, cholestasis, peliosis hepatic and hepatocellular hyperplasia, and carcinomas in humans have occurred, as noted in several case reports of formerly young, healthy athletes that engaged in AAS abuse (Hartgens & Kuipers, 2004).

Nutritional Supplements and Other Ergogenic Aids

As an alternative to banned ergogenic substances, nutritional supplements are widely marketed and used by many athletes at various competitive levels. Although nutritional supplements are marketed as safe and naturally occurring compounds, one must be careful when taking these supplements, as FDA jurisdiction over them is limited. Because nutritional supplements are not subject to FDA testing, their safety is often unknown (Metzl et al., 2001).

Perhaps one of the most popular nutritional supplements is creatine, with yearly sales over $400 million (Metzl et al., 2001). Creatine is a naturally occurring substance in the body that is produced by the liver, kidneys, and pancreas (Metzl et al.). This compound can also be found in protein-rich

sources such as meat and fish, and is only needed in small amounts to fulfill the total daily requirement of 2g/day (Metzl et al.).

Creatine is thought to provide increased bursts of energy available for muscle contraction so that longer intensity workouts may be achieved. Energy production comes from the increased formation of adenosine triphosphate (ATP) from adenosine diphosphate (ADP). While several studies have documented that creatine supplementation improves baseline strength in adults, two proven adverse effects of creatine are weight gain and increased muscle compartment pressure, which may lead to muscle cramping (Juhn, 2003).

To date, there have been no studies that have shown the effectiveness of creatine supplementation in people younger than 18 years old. In fact, there are no data documenting the safety of creatine in children or adolescents. Because creatine has not been studied thoroughly, both the short-term and long-term effects of routine use, especially in adolescents, are of great concern. There are currently two documented cases of adult-onset of renal failure with creatine use reported in the medical literature (Metzl et al., 2001). Therefore, in the most recent position statement on creatine, the American College of Sports Medicine discouraged usage in people younger than 18 years old because of the unknown potential adverse health effects (Metzl et al.).

Other ergogenic aids marketed to athletes include amino acids, chromium picolinate, ephedrine, Human Growth Hormone, beta-hydroxy-beta-methylbutyrate (HMB), and Androstenedione. Amino acids are the building blocks of protein, and are marketed to increase protein synthesis for improved muscle strength and development. However, if taken in abundance, amino acid supplementation can result in problems with protein metabolism (Insel & Roth, 2000).

Chromium picolinate is a supplement taken to increase muscle mass and decrease body fat (Insel & Roth, 2000). Although researchers state there are no significant effects of this supplement on fat-free mass or body fat, they do report that high doses may cause DNA damage that can lead to cancer (Insel & Roth). The long-term effects of chromium picolinate are currently unknown (Insel & Roth).

Ephedrine is another supplement taken to decrease body fat and increase training intensity (Insel & Roth, 2000). Although there is no evidence for increased training intensity, ephedrine can result in a decreased appetite and produce a stimulant effect, especially if taken with caffeine (Insel & Roth). Continual use of ephedrine can lead to abnormal heart rhythms, nervousness, headache, and gastrointestinal distress (Insel & Roth).

Human Growth Hormone and HMB (beta-hydroxy-beta methylbutyrate) are two ergogenic aids administered to increase muscle mass, strength, and power and decrease body fat (Insel & Roth, 2000). While both supplements

increase muscle mass and strength, Human Growth Hormone can cause serious side effects, including enlargement of the heart and onset of diabetes (Insel & Roth). Although HMB has no reported side effects, the long-term effects of this supplement are unknown (Insel & Roth).

Androstenedione is a natural steroid hormone found in animals and plants, and is produced in the gonad and adrenal glands (Insel & Roth, 2000). If taken as a supplement, increased blood levels of androstenedione and testosterone occur, resulting in increased energy, recovery and growth from exercise (Insel & Roth). In addition, researchers note androstenedione supplementation increases sexual arousal and function, and overall sense of well-being (Insel & Roth). Currently, because the long-term side effects associated with androstenedione usage are unknown, officials of the NCAA and International Olympic Committee have banned the substance (Ahrendt, 2001). However, androstenedione usage at the professional level is still legal.

Adolescent Performance-Enhancer Usage

Use of performance-enhancers is widespread among adolescents with steroids, creatine, and androstenedione currently among the most used ergogenic substances (Gomez, 2002, Luetkemeier et al., 1995; Tyler, Lauver, & Zitans, 1991). While U.S.A. prevalence rates for steroid use generally range between 4% and 12% among male adolescents, approximately 2% of female adolescents are engaging in usage as well (Bahrke et al., 1998). In

order to determine the adolescent populations most susceptible to performance-enhancer usage, Scott and colleagues (1996) studied 62 Nebraska secondary school systems to determine the extent of anabolic steroid use in adolescent sport participants and non-participants. Out of 4722 students in grades 7 through 12 surveyed, 3183 (67.4%) identified themselves as participants in school-sponsored sports. Approximately 4.5% of all male respondents and 0.8% of all female respondents used steroids, with 72.6% being sport participants. Similarly, in 1990 Terney and McLain surveyed 2113 high school students on general knowledge, awareness of risks and side effects, and usage rate of anabolic steroids. Almost half of the females surveyed reported steroid use, with athletes reporting higher usage rates than nonathletes. These results indicate that performance-enhancer usage among adolescents is primarily by athletes engaging in competition, indicating a need to intervene in this population.

There is some evidence that performance-enhancer usage varies by sport. Luetkemeier and colleagues (1995) administered a survey to approximately 2,200 junior and senior high school students in the Salt Lake City, Utah metropolitan area to determine the prevalence of AAS use among this population. Although steroid use was proportionally greater in boys than in girls, approximately 1.4% of females participating in strength training activities used steroids. Of the AAS users, 19% were in the 9th grade, 19% were in the 10th grade, 9.5% were in the 11th grade, and 12.7% were in the 12th grade.

Luetkemeier and colleagues concluded that athletes participating in sports that require strength, such as gymnastics, skiing, hockey and tennis are most likely to use steroids (Luetkemeier et al., 1995). These highly competitive sports attract a majority of female athletes at the junior and senior high school levels, thereby increasing the potential risk of usage by this group.

In a 2001 study by Metzl and colleagues, 5.6% of 1103 middle and high school athletes admitted taking creatine, a nutritional supplement that causes water retention in muscles and increased bursts of energy for workouts or competition (Metzl et al., 2001; Millman & Ross, 2003). Although the use of creatine is not recommended in people younger than 18 years of age, athletes from grades 6 to 12 reported usage, and out of 492 girls surveyed, 1.8% took creatine. Metzl and colleagues concluded that despite current recommendations against use in adolescents younger than 18 years old, creatine is being used by middle and high school athletes at all grade levels. In fact, the prevalence rate in grades 11 and 12 is approaching levels equal to collegiate athletes (Metzl).

Ray and colleagues (2001) also studied creatine usage among a sample of 674 adolescent athletes from 11 high schools. A questionnaire assessing awareness and use of creatine supplementation revealed that 75% of those surveyed had knowledge of creatine supplements, and 16% used creatine to enhance athletic performance. Similar to the findings reported by Metzl and associates, awareness and use were greater among boys than girls. Adverse

effects of creatine supplementation were reported by 26% of all athletes surveyed. Ray et al. concluded that creatine use by adolescent athletes is significant and inconsistent with optimal dosing; athletes are consuming more creatine than the scientifically recommended amount for adults of 20 g/day for the first 5 days, followed by the 5g/day maintenance dose (Juhn, 2003). Because there are no data documenting the safety of creatine in children or adolescents, proper dosage amounts and long-term side effects for this population are unknown. Therefore, physicians, health educators, and coaches must be aware and stay abreast of the most current information available on creatine in order to appropriately advise adolescent athletes (Ray et al., 2001).

Collegiate Performance-Enhancer Usage

In addition to increased rates of performance-enhancer usage at the junior and senior high school levels, studies show an increase in performance-enhancer usage among collegiate female athletes as well. LaBotz and Smith (1999) surveyed creatine usage by collegiate varsity and junior varsity athletes from one NCAA Division I athletic program. The most common sources of creatine information for the athletes surveyed were friends and teammates, while the most common effects expected and perceived from creatine usage were increased strength and muscle size. This study supports the need for prevention education at the high school level, as approximately

4% of the collegiate female athletes surveyed used creatine, with one-third first using it in high school (LaBotz & Smith).

In addition, Green and colleagues (2001) studied substance-use patterns of athletes from 30 sports competing at 991 NCAA Division I, II, and III institutions. Athletes surveyed answered questions regarding usage of alcohol, amphetamines, anabolic steroids, cocaine/crack, ephedrine, marijuana, psychedelics, and smokeless tobacco. The overall response rate was 64.3% with 637 of 991 schools reporting usable data on 13,914 student-athletes. Green and colleagues noted the highest likelihood of amphetamine use in Division III institutions, and the highest likelihood of cocaine use in Division II schools. Both amphetamines and cocaine may increase aggressiveness and are thought to improve performance via enhanced concentration (Smith & Perry, 1992). From Green and colleagues' study, one can conclude that the current drug prevention education at the high school level is not working, as collegiate athletes at different competitive levels are engaging in some form of drug usage to either enhance performance or deal with pressure.

Further, Spence and Gauvin (1996) surveyed Canadian university athletes on overall drug use. Of the 282 female athletes surveyed, 23.4% (12.5% being swimmers) consumed weight-loss products for performance or appearance purposes, while the highest use of anabolic steroids was reported by female soccer players (3.2%). Fifty percent of all female athletes

surveyed used caffeine, with high percentages occurring in both volleyball (76.2%) and track (75%) participants. This study supports the notion that prevention education in terms of the factors (i.e., peer pressure, body image issues) leading to performance-enhancer usage needs to be addressed during the high school years, when adolescents are most impressionable.

Chng and Moore (1990) assessed knowledge, attitudes, and use of steroids among male and female athletes attending a university in northern Texas. Although results yielded a much higher percentage of male athletes reporting steroid use, 10% of the female athletes surveyed also engaged in some type of usage. From these results, one may conclude that the number of collegiate female athletes using performance-enhancers appears to be increasing, indicating a need to intervene prior to the college years.

Finally, Nattiv and associates (1997) performed a multicenter, cross-sectional study with seven major geographically represented U.S. collegiate institutions. A total of 2,298 college athletes and 683 randomized nonathlete controls completed a survey assessing lifestyle and health-risk behaviors over the previous 12 months. Overall, female athletes demonstrated significantly higher risk-taking behaviors than their nonathlete peers regarding anabolic steroid usage (Nattiv et al., 1997). The results of this study parallel the findings reported by Scott and colleagues (1996) in the adolescent population: Both studies found that performance-enhancer usage was more likely to occur among athletes engaging in competition as compared to

nonathletes. Obviously, drug and performance-enhancer usage patterns among athletes are being established during the high school years, supporting the need for better prevention education at this level.

Professional Female Athlete Performance-Enhancer Usage

While performance-enhancer usage by professional male athletes is well-known, less attention is paid to steroid use by professional female athletes. However, as early as 1985, professional female athletes have tested positive for anabolic steroids (Strauss et al., 1985). In one of the early studies of anabolic steroid usage among women athletes, Strauss and colleagues looked at the perceived effects of usage among ten weight-trained women in 1985. All ten women competed at the national level in strength sports and trained with heavy weights several times each week. Responses to a 53-item questionnaire completed by the ten women found that all participants justified their use of steroids on the grounds that the drugs were necessary to win; the side effects, although sometimes undesirable, were acceptable; and the use of anabolic steroids was within their individual rights. The results of this study indicate that women were feeling the excessive pressure to win even before the explosion of women's sports in the mid to late 1990s. A 1985 study by Bergman and Leach yielded similar results, as Olympic-caliber athletes indicated that the need to win or to maximize performance superseded any worries about future health problems resulting from anabolic steroid usage. The evidence provided in these two studies supports the need to educate

female athletes at a young age about the pressures associated with competition, so that healthy coping mechanisms can be implemented that will build self-esteem.

Further, Tricker and associates (1989) explored the incidence of anabolic steroid use among competitive male and female bodybuilders in Kansas and Missouri. Of the 380 men and women bodybuilders surveyed, 68 females returned a completed questionnaire. Ten percent of the female competitors surveyed reported using steroids, with the desire to win being cited as the major reason for use. Although users were aware of the health risks associated with steroid use, they reported that this knowledge did not deter them from engaging in usage (Tricker et al., 1989). This pattern of thinking is not changing, as demonstrated in a 2003 study conducted by Millman and Ross. Despite all of the education available today on the negative effects of performance-enhancer usage, Millman and Ross found that many professional athletes facing extreme pressure to excel feel that the potential benefits of taking performance-enhancers outweigh the associated risks (Millman & Ross, 2003). Therefore, healthy coping strategies for these pressures need to be addressed at earlier competitive levels, such as the high school level, to lessen the extremity of the pressures felt by these athletes later in life.

Finally, Gruber and Pope (2000) conducted psychiatric and medical evaluations of 75 dedicated women athletes in the Boston, Massachusetts

area. Twenty-five (33%) of these women reported current or past AAS use. Users were more muscular than nonusers and reported use of many other ergogenic drugs in addition to AAS. Fourteen (56%) of the users reported hypomanic symptoms during AAS use and 10 (40%) reported depressive symptoms during AAS withdrawal. Nineteen (76%) users reported at least one adverse medical effect associated with AAS use, and most exhibited psychiatric syndromes such as rigid dietary practices (eating disorders), nontraditional gender roles, and chronic dissatisfaction and preoccupation with their physiques (Gruber & Pope, 2000). This study supports the notion that female athletes feel both internal and external pressures to succeed as well as attain a "perfect" physique. By surveying female athletes at younger age levels to determine their perception of the pressures leading to performance-enhancer usage, prevention-education programs emphasizing healthy coping mechanisms (i.e., self-esteem building, body image counseling, and stress management techniques) can be implemented. Intervention during the adolescent years may help athletes obtain more realistic and positive body perceptions and dietary practices. As a result, performance-enhancer usage may diminish among athletes at higher levels.

Conclusion

All of the studies reviewed here indicate that performance-enhancer usage is quite prevalent among athletes at many different competitive levels despite the vast amount of knowledge indicating harmful physical and psychological

effects. Although usage is occurring among male and female adolescents as well as collegiate and professional athletes, research shows that experimentation often begins during the high school years, with usage among female athletes at this level increasing. Although some reasons female athletes cited for usage include the pressure to win and the desire to improve physical appearance, the question still remains: Why are female athletes so willing to jeopardize their health for the sake of winning or improving their appearance? The purpose of the proposed study is to determine some of the major issues that lead to the usage of performance-enhancers among competitive female athletes at the high school level. The findings may assist health educators and coaches in developing prevention-education programs to help athletes obtain healthy coping mechanisms and make informed decisions about engagement in usage.

Chapter III

METHODS

The study used a pretest-only between-subjects, Likert Scale survey design to rank the importance of some of the internal and external pressures that may lead to performance-enhancer usage among female athletes at the high school level. In order to achieve a medium effect size of .30, as defined by Cohen's Specialty Convention, a minimum of 120 participants were needed to obtain a power of .85. The target population consisted of female athletes from top-ranked sport programs in New Jersey high schools. Subject selection criteria included membership in varsity sport teams ranked at the top 10% of the state and participation in a particular sport for at least two years. The Seton Hall University Institutional Review Board approved the research proposal for this study. One hundred and twenty-two subjects were included in the study sample.

Subjects

All athletes in the target population at the selected New Jersey high schools who met the inclusion criteria were invited to participate in the study. Top-ranked sport teams were identified from the sports editors' poll of the Newark Star Ledger and Courier Post newspapers. Initially, the names and phone numbers of the high school athletic coaches, whose teams met the

specified criteria for participation, were obtained from high school websites. Once these individuals were identified, the researcher contacted the coaches by phone to obtain verbal permission to administer the survey to team members. Once verbal permission was obtained, the researcher sent the coaches a formal letter of invitation, which explained the purpose of the study, along with the informed consent forms for the athletes' parents to sign. The researcher met with the coaches and team members prior to a practice session to collect the consent forms and distribute the survey. Athletes who obtained parental consent and wanted to participate completed the survey. Consent to participate from the athlete was demonstrated by the athlete voluntarily completing the survey and putting it into the locked survey collection box. Confidentiality and other rights of athletes consenting to participate were protected in accordance with IRB requirements.

Study Sites

Potential study sites were identified from New Jersey newspapers. Rankings of high school sport teams were displayed in the Newark Star Ledger and Courier Post newspapers. The researcher personally telephoned coaches and athletic directors of these teams at each high school site to discuss the study rationale and preliminary study procedures. Coaches interested in participating or receiving further information were sent a letter by e-mail that specifically explained the study design and procedures. Coaches were also provided with copies of the informed consent and the survey

instrument (see Appendix A), if desired. The participating seven high schools were from the northern, central, and southern regions of the state of New Jersey.

Instrumentation

Validity Studies

Content validity of the survey instrument was obtained from a pilot study (See Appendix C) conducted with a panel of six coaches of women's sports considered to be experts in their field. Individuals included in the panel met the following criteria: 1) employed as a college coach of female athletes 2) obtained at least a 70% team win percentage 3) coached a nationally ranked team and 4) participated in their particular sport at the college level.

The research strategy used in the pilot study was the Delphi technique (See Appendix C for background and explanation). The Delphi technique uses expert opinion to arrive at a consensus about planning or problem-solving issues (McDermott & Sarvela, 1999). In the field of health education, it is used to examine the mental, physical, and spiritual perceptions associated with "wellness" (Mullen, 1983; Scaffa, 1992).

Procedures

The survey was administered prior to practice sessions to the high school female athletes who obtained parental consent and chose to participate in the study. The researcher distributed the surveys and answered athletes' general

questions, and then left the room for approximately 30 minutes so that the athletes could complete the survey. Athletes placed their completed surveys in a locked box with an open slot. After the 30 minutes, the researcher re-entered the room and retrieved the box. All information collected in the study was confidential and securely stored in a locked cabinet to which only the researcher had access.

Data Analysis Methods

Data obtained from each of the 122 completed surveys were coded and entered into the Statistical Package for Social Sciences (SPSS 9.0) computer software program. The distribution of the data was examined to determine which statistical methods would be most appropriate for assessing the importance of the issues in leading to performance-enhancer usage among high school female athletes.

Independent Variables

The nine independent variables were the issues presented in the survey: (1) pressure to win; (2) peer pressure by teammates; (3) pressure by the school to win; (4) self-induced competitive pressures; (5) conscious or unconscious pressure by coaches; (6) issues relating to body image; (7) societal pressures; (8) competitive level; (9) curiosity/experimentation. The survey was constructed so that each of these independent variables had a numeric Likert Scale rating of 1-5 (see Appendix A for the distributed survey).

Dependent Variables

The five dependent variables were the following ratings of importance in the Likert Scale: (1) very important; (2) important; (3) moderately important; (4) unimportant; (5) most unimportant.

Descriptive Statistics

Data analysis included both descriptive and quantitative statistics. Descriptive statistics are procedures used for classifying and summarizing, or describing, numerical data (Hinkle, Wiersma, & Jurs, 1998). By using descriptive statistics, one is able to describe distributions and individual scores, and determine the relationship between variables (Hinkle, Wiersma, & Jurs, 1998). In this primarily descriptive study, population demographics as well as descriptive statistics including frequencies, means, medians, modes and standard deviations were calculated and used to examine trends in the Likert Scale scores for the nine issues presented in the survey to the female athletes. From the descriptive statistics, the researcher could determine whether data was normally distributed, so that the appropriate statistical test (i.e., parametric or nonparametric) could be conducted.

Statistical Testing

Statistical testing was performed to analyze the relationship between the independent and dependent variables. Since the data were not normally distributed, nonparametric statistics were used. The Chi Square Test of

Homogeneity, the Spearman Correlation Coefficient, and the Kruskal-Wallis One-Way Analysis of Variance are the nonparametric tests that were selected for data analysis. An alpha level of $p \leq .05$ was considered significant (Hinkle, Wiersma, & Jurs, 1998).

The Chi Square Test of Homogeneity

The Chi Square Test of Homogeneity is a nonparametric test used to compare observed frequencies of occurrence with theoretical or expected frequencies of occurrence (Hinkle, Wiersma, & Jurs, 1998). Observed frequencies are those that the researcher obtains empirically through direct observation, while theoretical or expected frequencies are developed on the basis of some hypothesis (i.e., that each Likert scale score would have an equal or 20% response rate among subjects) (Hinkle, Wiersma, & Jurs, 1998). The Chi-Square Test of Homogeneity was selected for this study, since each independent variable has two or more possible responses (dependent variable Likert Scale scores of 1 through 5). The test was used to analyze the relationship between the nine independent variables and the five dependent variables.

The Spearman Correlation Coefficient

In this study, the nine issues (independent variables) were ranked by their level of importance (dependent variables). Therefore, the data was ordinal. The Spearman Correlation Coefficient is a nonparametric test used to analyze

the relationship between two variables when both variables are ordinal (Hinkle, Wiersma, & Jurs, 1998). The Spearman Correlation Coefficient test was selected to analyze relationships between the nine independent variables and each of the five levels of importance. Specifically, this test was used to determine if a relationship existed between the rankings of the issues (e.g., to see if respondents who gave a certain issue a particular ranking tended to give another issue the same ranking).

The Spearman Correlation Coefficient is a number between +1 and -1. This number indicates both the magnitude and direction of the association between two variables (Hinkle, Wiersma, & Jurs, 1998). The magnitude is the strength of the correlation; the closer the correlation is to either +1 or -1, the stronger the correlation (Hinkle, Wiersma, & Jurs, 1998). The direction of the correlation indicates how the two variables are related; if the correlation is positive, the two variables have a positive relationship (as one increases, the other also increases), and if it is negative, the two variables have a negative relationship (as one increases, the other decreases) (Hinkle, Wiersma, & Jurs, 1998).

Kruskal-Wallis One-Way Analysis of Variance

For ordinal data, the nonparametric analog to one-way analysis of variance is the Kruskal-Wallis One-Way Analysis of Variance (Hinkle, Wiersma, & Jurs, 1998). This test can be used to determine differences in

the ranks of data when separated into two independent samples (Hinkle, Wiersma, & Jurs, 1998). In this study the Kruskal-Wallis One-Way Analysis of Variance for ranks was selected to analyze the differences in scores/ranks based on school and sport.

The Scheffé Post-Hoc Analysis

Post-hoc analysis was performed using the Scheffé Method. The Scheffé test may be used for any possible type of comparison, provides adequate control for family-wise error, is usually the most conservative of all comparison procedures, and allows only for non-directional hypothesis testing (Lomax, 2001). Further, it is the only multiple comparison procedure that is necessarily consistent with the results of the *F* ratio in the analysis of variance. If the *F* is significant, then at least one contrast from the family of linear contrasts, when tested by the Scheffé method, will also be significant (Lomax, 2001).

Chapter IV

RESULTS

Study Sample

The study sample consisted of 122 subjects. Each subject was a female athlete from a top-ranked New Jersey high school who voluntarily agreed to participate prior to survey administration. Subjects from Northern, Central, and Southern New Jersey were surveyed in order to obtain a broad sample representative of the state of New Jersey to strengthen the external validity of the results. Administration of the survey was done at each site, with the researcher present for survey distribution. This method of administration was used to ensure 100% survey completion by the athletes.

Analysis of the Data

The data obtained in this study were analyzed using both descriptive and quantitative statistics. Population demographics as well as descriptive statistics including frequencies, means, medians, modes, and standard deviations were calculated. The relationships between the nine issues presented and the five levels of importance were primarily analyzed using quantitative analyses. The results contributed to the analysis of the study hypothesis, "Coaching pressures, peer pressure, and the self-induced competitive pressure to win will be the factors most strongly related to

performance-enhancer usage among high school female athletes." They were also used to analyze the differences in the responses given based on school and sport. Although this analysis was not integral to the study hypothesis, the findings may contribute to a better understanding of how context influences performance-enhancer use.

Coding System

The nine issues were scored on the Likert Scale as follows: 1=very important; 2=important; 3=moderately important; 4=unimportant; 5=most unimportant. The same coding system was used for all statistical tests.

Descriptive Statistics

Population demographics were obtained to provide descriptive information (i.e., enrollment, competitive level, ethnicity, economic level, etc.) on the participating high schools. Descriptive statistics including frequencies, means, medians, modes, and standard deviations were calculated for each of the nine issues in the survey. Participants ranked the nine issues on a scale of 1 (very important) to 5 (most unimportant).

Demographic Characteristics of the Participating High Schools

Demographic characteristics were obtained for descriptive information about the participating high schools. Grade level, enrollment, competitive level, student ethnicity, grade standards, and student economic level for each school are presented in Table I. The demographic data was gathered to

provide information that may be useful when interpreting results derived from the statistical analyses.

Table I

Demographic Characteristics of the Participating High Schools

School	Grades	Enrollment	Competitive Level*	Student Ethnicity**	Grade Standards***	Student Economic Level****
A: North NJ	9-12	769	Group II	AA=<1% AI=0% As=4% H =3% W=93%	LA = 100% M = 98%	1%
B: Central NJ	9-12	3009	Group IV	AA=6% AI=0% As=4% H =1% W=88%	LA = 97% M = 87%	5%
C: Central NJ	9-12	1446	Group III	AA=18% AI=<1% As= 2% H=40% W=40%	LA = 79% M = 59%	47%
D: Central NJ	9-12	372	Group I	AA=3% AI=<1% As=1% H=9% W=85%	LA = 65% M = 58%	0%
E: South NJ	9-12	627	Group II	AA=9% AI=0% As=1% H=2% W=88%	LA = 93% M = 85%	19%
F: South NJ	9-12	1261	Group III	AA=26% AI=3% As=1% H =5% W=65%	LA = 75% M = 60%	23%
G: South NJ	9-12	1461	Group IV	AA=20% AI=1% As=1% H =11% W=68%	LA = 80% M = 64%	32%

*Competitive levels are based on school population; higher population = higher group placement.

**AA = African American; AI = American Indian; As = Asian; H = Hispanic; W = White

***Percent of students meeting NJ grade standards in Language Arts (LA) and Math (M)

****Percent of students receiving free or reduced-price lunch

Descriptive Statistics of Survey Data

Descriptive statistics in the form of frequencies, means, medians, modes and standard deviations were performed to analyze the distribution of the survey data obtained on the nine issues rated by level of importance. Examination of descriptive statistics allowed the researcher to determine if the data was normally distributed and which statistical tests should be used for further analysis. Descriptive statistics are presented in Figures 1 through 9 and Table II.

Frequency distributions.

Frequency distributions for the nine issues are presented in Figures 1 through 9. As previously stated, frequencies were calculated to determine the mean score for each issue and also to see if the data were normally distributed. The mean score represents the average ranking given by respondents for each issue. The mean scores and frequency distributions were used to determine which issues were considered most important among respondents. The pressure to win can be thought of as the internal pressure felt by the athlete to win at all costs. Pressure to win (see Figure 1) yielded a mean score of 1.9, indicating an average ranking between "very important" and "important." The standard deviation was 1.11, signifying that responses for the pressure to win had little variability around the mean. In examining the

frequency distribution, one can see that the data is not normally distributed for this issue. Out of 122 respondents, over half gave the pressure to win a ranking of 1 (very important) or 2 (important). Thus, the internal pressure felt by athletes to win at all costs was the issue ranked as most important in leading to performance-enhancer usage

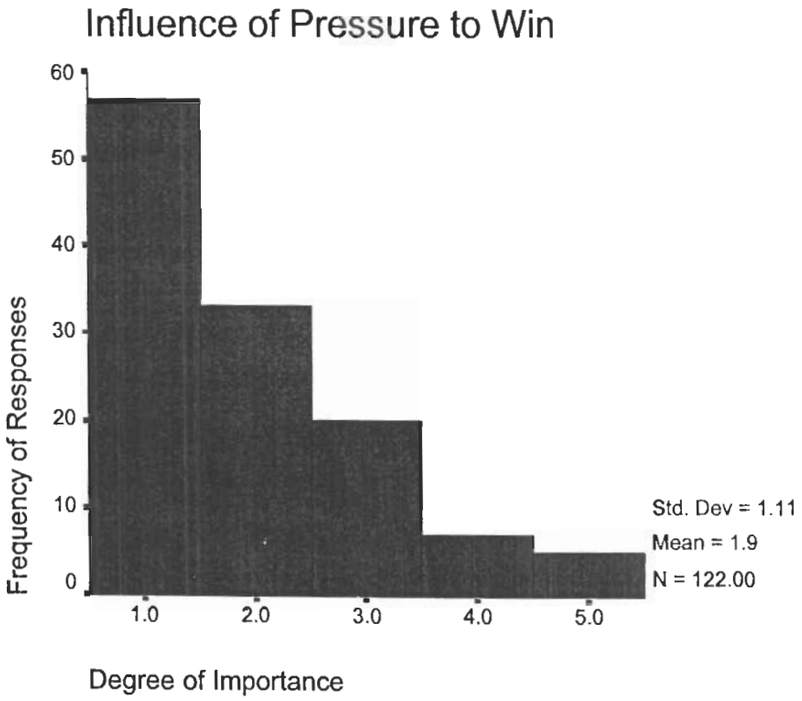

Figure 1. The Pressure to Win Frequency Distribution. The pressure to win yielded a mean score of 1.9, indicating an average ranking of between "very important" and "important" by respondents. The standard deviation was 1.11, signifying little variability around the mean.

The issue of pressure by teammates refers to the internal pressure that an athlete feels from a teammate. If a teammate is engaging in or promoting performance-enhancer usage to the athlete, or is pressuring the athlete in an intimidating way, the athlete may begin to engage in usage to perform better for the teammate. The external influence of pressure by teammates in leading to performance-enhancer usage resulted in mostly "moderately important" rankings. Frequencies of responses for pressure by teammates yielded a mean score of 2.9, indicating an average response of between "important" and "moderately important." One can conclude from examination of Figure 2 that respondents most frequently ranked this issue "moderately important." The standard deviation was 1.08, signifying that responses had little variability around the mean. However, one can see that over half of the 122 respondents gave pressure by teammates either a 2 (important) or 3 (moderately important) rating.

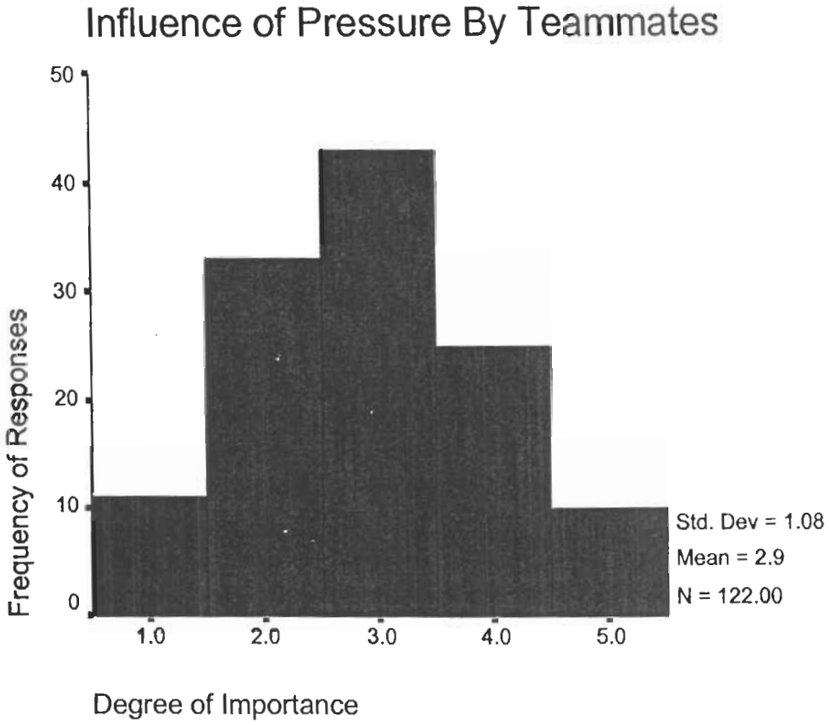
Influence of Pressure By Teammates
Frequency of Responses
50
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Std. Dev = 1.08
Mean = 2.9
N = 122.00
Degree of Importance

Figure 2. Peer Pressure by Teammates Frequency Distribution. Frequencies of responses for pressure by Teammates yielded a mean score of 2.9, indicating an average response of between "important" and "moderately important." The standard deviation was 1.08, signifying that responses had little variability around the mean.

Pressure by the school to win refers to the external pressures put on the athlete by athletic directors, teachers, classmates, etc. If a school has a winning tradition, students and staff are likely to have high expectations of athletes and constantly reinforce the importance of winning. Among the athletes surveyed in this study, this issue (see Figure 3) yielded a mean score of 3.1, indicating an overall response of "moderately important." The standard deviation was 1.1, signifying little variability of responses around the mean. As depicted in the frequency distribution, most respondents ranked this issue either moderately important or unimportant, indicating that the pressure by the school to win was not regarded as a highly significant precursor to performance-enhancer usage among the female athletes surveyed.

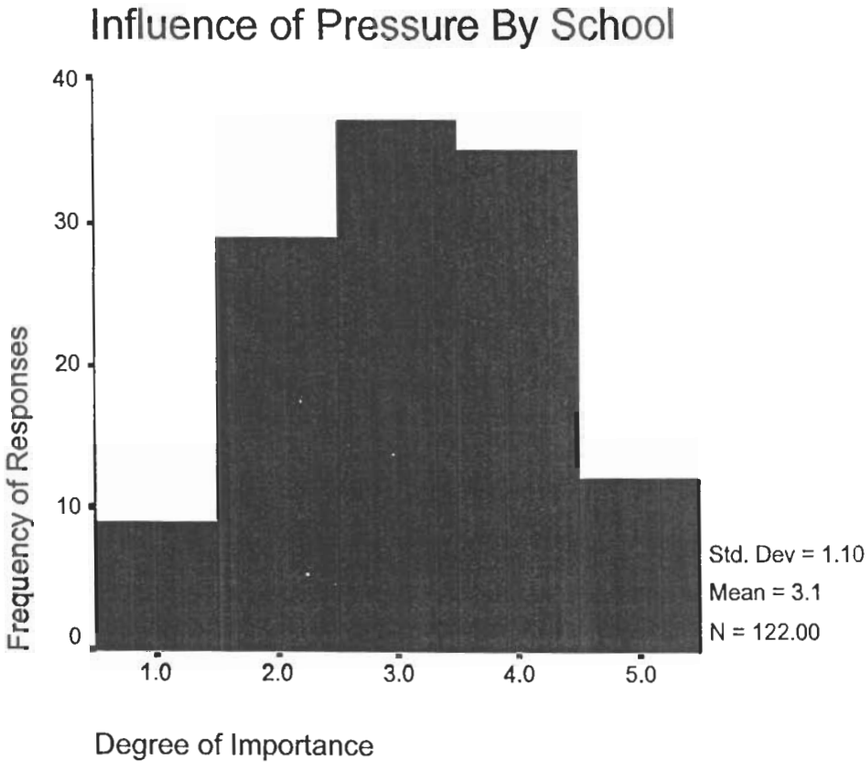
Influence of Pressure By School
Frequency of Responses
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Degree of Importance
Std. Dev = 1.10
Mean = 3.1
N = 122.00

Figure 3. Pressure by School to Win Frequency Distribution. Pressure by the School to Win yielded a mean score of 3.1, indicating an overall response of "moderately important." The standard deviation was 1.1, signifying responses of little variability around the mean.

Self-induced Competitive Pressure refers to the internal drive of the athlete or the pressures that the athlete puts on herself to win at all costs. This issue yielded a mean score of 2.0, indicating an average response ranking of "important." The standard deviation was 1.23, indicating little variability of responses around the mean. Therefore, most participants agreed that this issue was a potential precursor to engagement in performance-enhancer usage. As depicted in Figure 4, the data obtained for this issue were not normally distributed, as the majority of respondents ranked this issue "very important."


Influence of Self-Induced
Competitive Pressures to Win
Frequency of Responses
70
60
50
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Std. Dev = 1.23
Mean = 2.0
N = 122.00
Degree of Importance

Figure 4. Self-Induced Competitive Pressures Frequency Distribution. Self-induced Competitive Pressure yielded a mean score of 2.0, indicating an average response ranking of "important." The standard deviation was 1.23, indicating little variability of responses around the mean.

Pressure by Coaches refers to the external pressures put on the athlete by her coach(s) to perform at an optimal level and win at all costs. This issue yielded a mean score of 2.5, indicating an average response of between "important" and "moderately important." The standard deviation was 1.14, signifying little variability of responses around the mean. These results show that the athletes surveyed in this study considered pressure by coaches a significant potential reason for engagement in performance-enhancer usage. As shown in Figure 5, over 100 of the 122 athletes surveyed ranked this issue either 1, 2, or 3, indicating a majority of responses in the "very important" to "moderately important" range.

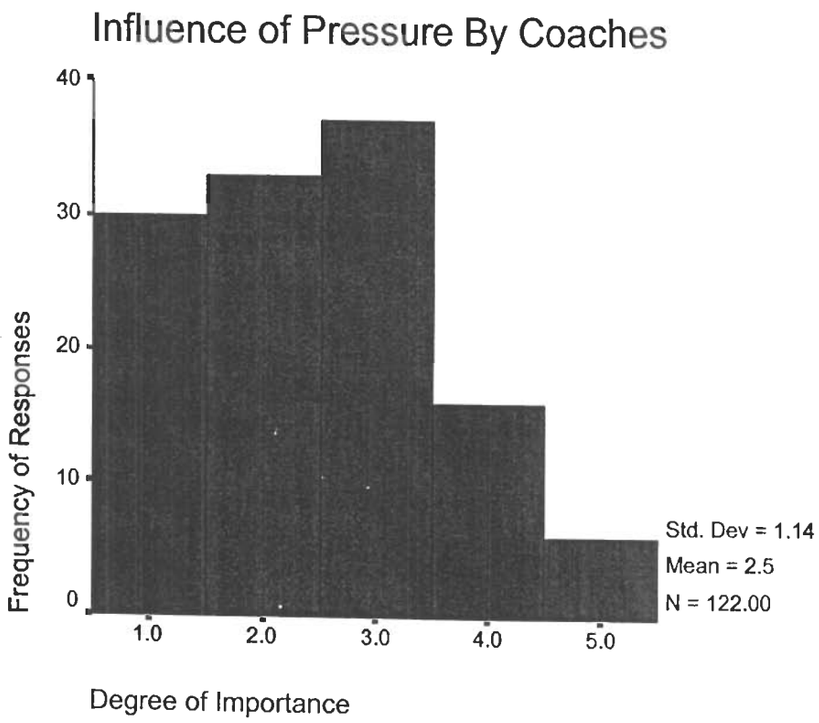
Influence of Pressure By Coaches
Frequency of Responses
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Degree of Importance
Std. Dev = 1.14
Mean = 2.5
N = 122.00

Figure 5. Pressure by Coaches Frequency Distribution. Pressure by Coaches yielded a mean score of 2.5, indicating an average response of between "important" and "moderately important." The standard deviation was 1.14, signifying little variability of responses around the mean.

Issues Relating to Body Image are the internal thoughts, feelings, and opinions that the athlete holds about her body shape, build, or weight. Certain sports require an athlete to possess a particular body shape or weight to excel. For example, swimmers are expected to be very strong and lean to perform and succeed at optimal levels, while gymnasts are expected to be small in stature with large muscle mass for strength. Each sport has a certain body type that is thought to be best suited for athletic performance. Therefore, female athletes may engage in performance-enhancer usage as a result of the pressure to develop and maintain a specific body build or shape. Issues relating to body image yielded a mean score of 2.7, indicating an average response between "important" and "moderately important." The standard deviation was 1.26, indicating little variability of responses around the mean. Figure 6 depicts the most frequent response of "moderately important" among the athletes surveyed. The results of this issue are similar to those obtained for pressure by coaches, as the majority of athletes gave it a ranking of 1, 2, or 3. Therefore, the athletes in this study considered issues relating to body image an important potential factor leading to performance-enhancer usage.

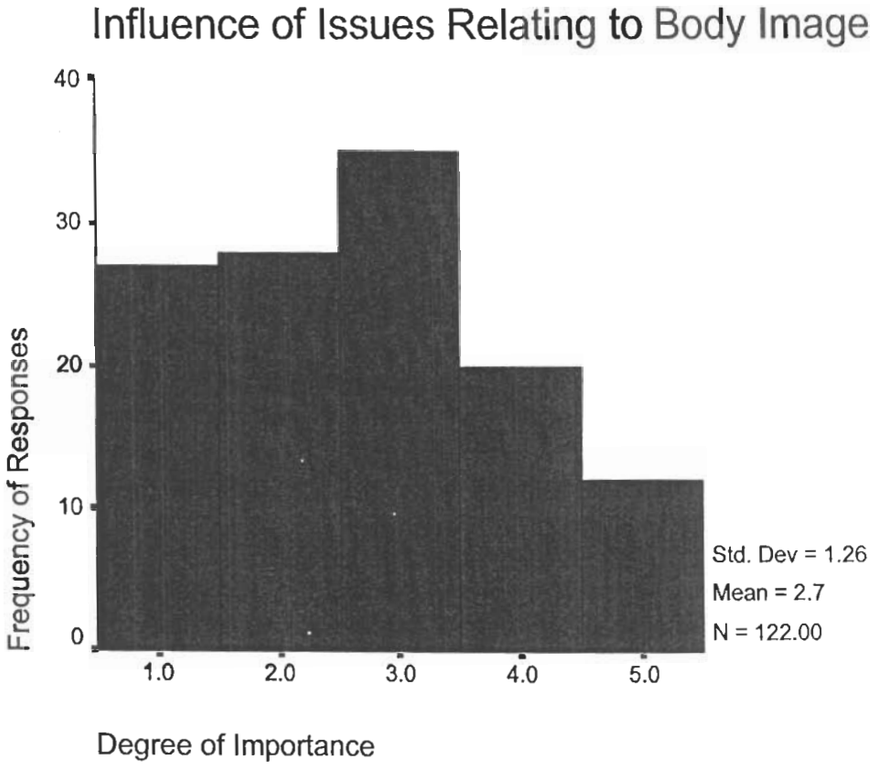
Influence of Issues Relating to Body Image
Frequency of Responses
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Std. Dev = 1.26
Mean = 2.7
N = 122.00
Degree of Importance

Figure 6. Issues Relating to Body Image Frequency Distribution. Issues Relating to Body Image yielded a mean score of 2.7, indicating an average response of between "important" and "moderately important." The standard deviation was 1.26, indicating little variability in responses around the mean.

Societal Pressures refer to the external pressures put on the athlete by society to look a certain way. Due to the abundance of media portraying a certain body type, weight, and height as the optimal way to look, individuals may feel the pressure to achieve this body type in order to be considered beautiful or accepted by society. The female athlete affected by this issue has the added pressure of achieving a particular body build for both her sport and society. Societal pressures yielded a mean score of 3.3, indicating an average response of "moderately important" to "unimportant." The standard deviation was 1.21, indicating little variability of responses around the mean. As depicted in the frequency distribution (see Figure 7), most respondents ranked this issue 3, 4, or 5, indicating a majority of responses in the "moderately important" to "most unimportant" range. Therefore, the athletes surveyed did not consider this issue a prominent factor in leading to engagement in performance-enhancer usage.

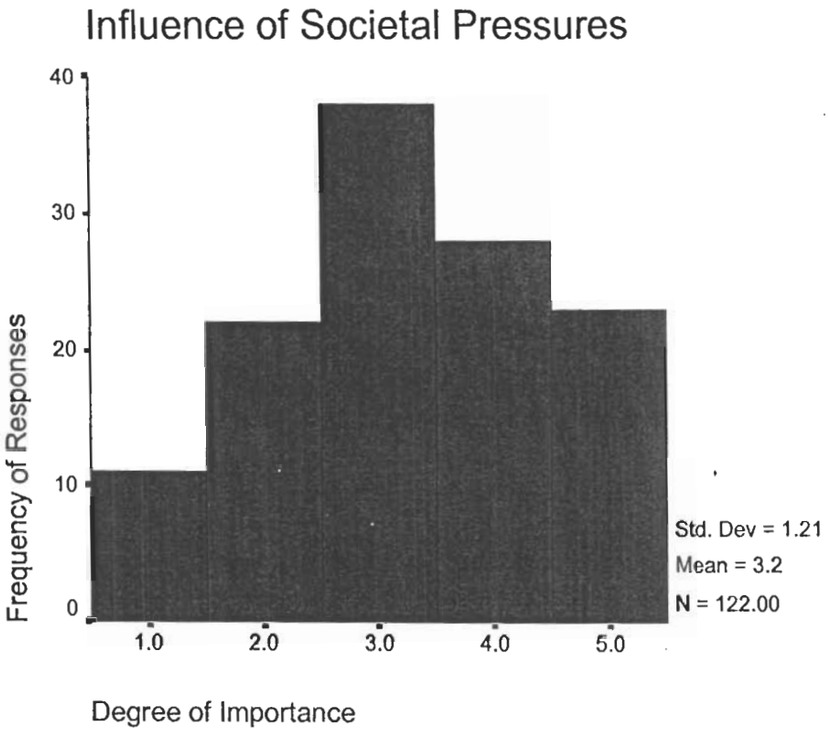
Influence of Societal Pressures
Frequency of Responses
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Std. Dev = 1.21
Mean = 3.2
N = 122.00
Degree of Importance

Figure 7. Societal Pressures Frequency Distribution. Societal Pressures yielded a mean score of 3.3, indicating an average response of between "moderately important" and "unimportant." The standard deviation was 1.21, indicating little variability of responses around the mean.

Competitive Level refers to the assigned group level given to each school, ranging from 1 to 4. Group level is based on student population size, as those schools with smaller populations are ranked in Group 1 or 2 and those with larger populations are ranked in Group 3 or 4. Higher group levels usually are more competitive, as there is the potential for more athletes simply due to population size. Competitive level yielded a mean score of 2.2, indicating an average response of between "important" and "moderately important." The standard deviation was 1.25, signifying little variability in responses around the mean. As shown in Figure 8, over half of the respondents ranked this issue either 1 (very important) or 2 (important). Therefore, most of the athletes surveyed considered this issue a significant factor potentially leading to performance-enhancer usage.

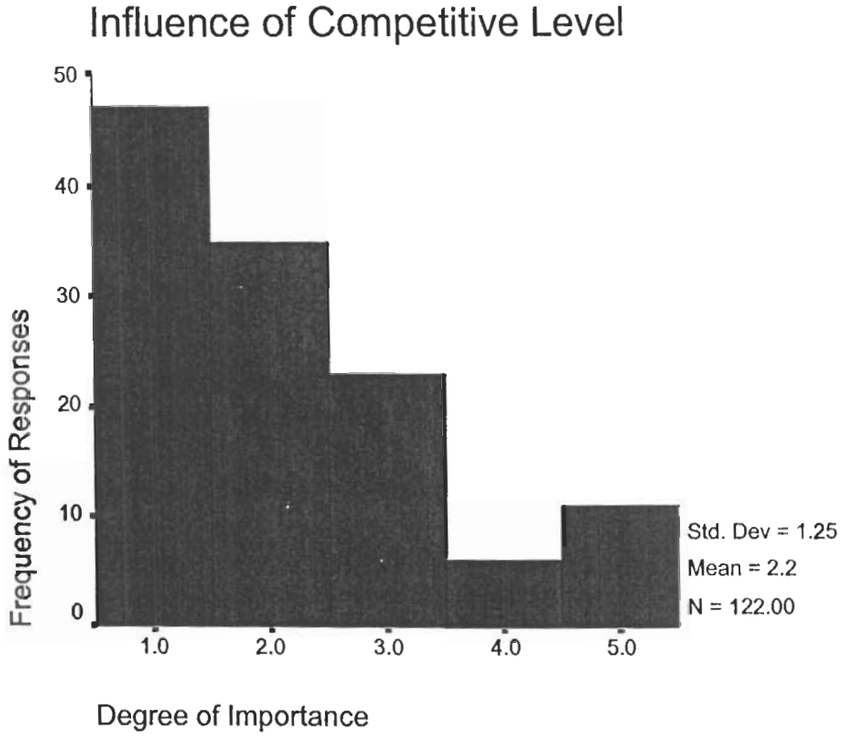
Influence of Competitive Level
Frequency of Responses
50
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Std. Dev = 1.25
Mean = 2.2
N = 122.00
Degree of Importance

Figure 8. Competitive Level Frequency Distribution. Competitive Level yielded a mean score of 2.2, indicating an average response of between "important" and "moderately important." The standard deviation was 1.25, signifying little variability in responses around the mean.

Curiosity/Experimentation deals with the internal desire of the athlete to try a performance-enhancer due to inquisitiveness. This issue yielded a mean score of 3.3, indicating an average ranking of between "moderately important" and "unimportant." The standard deviation was 1.26, signifying little variability in responses around the mean. As depicted in Figure 9, the majority of respondents ranked this issue as 3, 4, or 5. Therefore, most of the athletes surveyed did not feel that this issue was of major importance when considering whether to use performance-enhancing drugs.

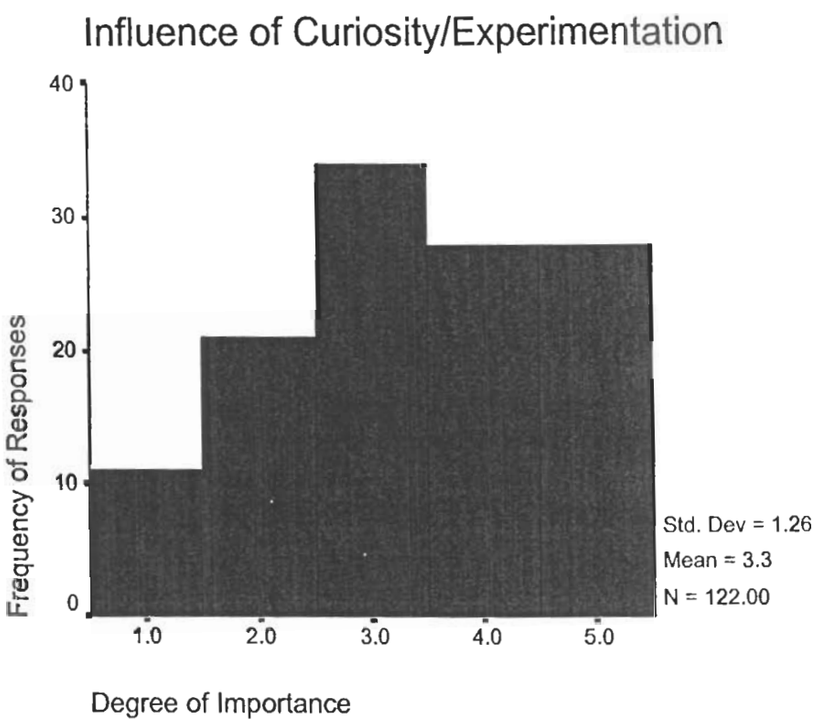
Influence of Curiosity/Experimentation
Frequency of Responses
40
30
20
10
0
1.0
2.0
3.0
4.0
5.0
Std. Dev = 1.26
Mean = 3.3
N = 122.00
Degree of Importance

Figure 9. Curiosity/Experimentation Frequency Distribution. Curiosity/Experimentation yielded a mean score of 3.3, indicating an average ranking between "moderately important" and "unimportant." The standard deviation was 1.26, signifying little variability of responses around the mean.

Descriptive Analysis

The mean, standard deviation, median, and mode of responses for each of the nine issues are shown in Table II. The median and mode were obtained to determine the middle score and most frequent score, respectively. This analysis allowed the researcher to determine which issues respondents ranked highest and lowest in terms importance in leading to performance-enhancer usage.

Table II

Distribution of Likert Scale Scores For Nine Issues Pertaining To Performance-Enhancer Usage

Issue	Number of Respondents	Mean	Standard Deviation	Median	Mode
Pressure to Win	122	1.93	1.11	2	1
Self-Induced Competitive Pressures	122	2.02	1.23	2	1
Competitive Level	122	2.17	1.25	2	1
Conscious or Unconscious Pressure By Coaches	122	2.47	1.14	2	3
Issues Relating to Body Image	122	2.69	1.26	3	3
Peer Pressure by Teammates	122	2.92	1.08	3	3
Pressure by School	122	3.10	1.10	3	3
Societal Pressures	122	3.25	1.22	3	3
Curiosity/Experimentation	122	3.34	1.26	3	3

Participants generally showed limited variability in their responses to the 9 issues pertaining to performance-enhancer usage. Most participants ranked the issues "moderately important" to "very important," with a median score of 3 (moderately important) on the last five issues on Table II. The first four issues on Table II had a median score of 2, indicating a ranking of "important" for these issues. The mode, or most frequent score, for the pressure to win, self-induced competitive pressures, and competitive level was 1 (very important). However, for all other issues, the mode was 3 (moderately important). These results suggest that the pressure to win, self-induced competitive pressures, and competitive level were the issues most frequently scored "very important" in leading to performance-enhancer usage, while the remaining six issues were only considered "moderately important." Individual participant responses to each of the nine issues are numerically presented in Appendix D. The standard deviation varied from 1.08 to 1.26. In summary, the data were not normally distributed and suggest that the female athletes surveyed tended to have a high level of agreement regarding the level of importance of each of the nine issues presented. Therefore, nonparametric testing was used to further analyze the relationships between the nine issues and five levels of importance.

Statistical Testing Analysis

Chi Square Test of Homogeneity

The data analysis using the Chi Square Test of Homogeneity suggested that there were significant differences ($p \leq .05$) between all nine issues and their corresponding level of importance. These results indicate that there was a significant difference noted in the level of importance for each of the nine issues presented to the female athletes, and that these differences were not due to chance. Results of the Chi Square Test of Homogeneity are presented in Appendix D.

Spearman Correlation Coefficient

Using the Spearman analysis, significant relationships were found between the issues presented in Table III. All correlations were positive, indicating that as participants gave one issue a particular ranking, they also tended to give another issue the same ranking. For example, those athletes who gave societal issues a specific numeric rank (Spearman r = .516, p=.000) also tended to give issues relating to body image the same numeric rank. Another moderately strong correlation (Spearman r = .284, p=.001), was found between the pressure to win and pressure by teammates.

Table III

Spearman Significant Correlations

Issues	Spearman r	P value
Pressure to win & Pressure by teammates	.284	.001
Pressure to win & Pressure by school	.196	.031
Pressure by school & Pressure by teammates	.424	.000
Pressure to win & Self-induced competitive pressures	.437	.000
Pressure to win & Pressure by coaches	.417	.000
Pressure to win & Issues related to body image	.226	.012
Pressure to win & Competitive Level	.319	.000
Pressure by teammates & Pressure by coaches	.396	.000
Pressure by teammates & Curiosity	.248	.006
Pressure by school & Societal pressures	.272	.002
Pressure by school & Self-induced competitive pressures	.232	.010
Pressure by school & Pressure by Coaches	.390	.000
Pressure by teammates & Self-induced competitive pressures	.224	.013
Pressure by school & Competitive level	.210	.020

Spearman Significant Correlations

Issues	Spearman r	P value
Pressure by school & Curiosity	.269	.003
Pressure by coaches & Self-induced competitive pressures	.429	.000
Pressure by coaches & Issues relating to body image	.263	.003
Pressure by coaches & Competitive level	.267	.003
Pressure by coaches & Curiosity	.299	.001
Self-induced competitive pressures & Issues relating to body image	.200	.027
Societal pressures & Issues relating to body image	.516	.000
Self-induced competitive pressures & Curiosity	.223	.013

Kruskal-Wallis One-Way Analysis of Variance

The Kruskal-Wallis Test was performed to determine the differences in responses when grouped by school and sport. Results of this test indicated that there were significant differences ($p \leq .05$) by school in responses for pressure by teammates, pressure by school, pressure by coaches, competitive level, and curiosity/experimentation. When grouped by sport, responses were significantly different for the issues of pressure by

teammates, body image, and competitive level. Kruskal-Wallis Test results are presented in Appendix D.

Post – Hoc Test Results

Post-hoc tests were performed to determine which means differed significantly after the ANOVA test was performed. Specifically, the Scheffé method was chosen because it is used to test non-directional hypotheses, may be used for any possible type of comparison, provides adequate control for family-wise error, and is usually the most conservative of all comparison procedures (Lomax, 2001). Results of the Scheffé procedure (see Appendix D) reinforced the results obtained from the Kruskal- Wallis Test, as pressure by coaches was significant when grouped by school, while competitive level was significant when grouped by school and sport. The results of the post-hoc procedure further support what was found in the Kruskal-Wallis One-Way ANOVA, which was that the responses for importance of pressure by coaches and competitive level were significantly different for each school, and responses for competitive level were significantly different for each sport. This indicates that perhaps coaching style significantly influences an athlete's willingness to engage in performance-enhancer usage; and that athletes with the opportunity to compete at higher levels in various sports (i.e., tennis, swimming, basketball) possibly feel more pressure to engage in usage than those competing at lower levels (i.e., softball).

Chapter V

DISCUSSION

The study participants were 122 female athletes from seven top-ranked, New Jersey high schools. Athletes participating in basketball, softball, tennis, soccer, swimming, and field hockey were included in the study sample. These individuals were primarily of middle-class socioeconomic status, and from academic institutions that either met or exceeded the New Jersey state grade standards for Language Arts and Math.

The primary purpose of this study was to identify some of the major issues that lead to the usage of performance-enhancers among female athletes at the high school level so that markers for a prevention-education program could be obtained. The findings of this study add to the existing knowledge base on performance-enhancer usage among athletes. The study tested the following hypothesis: "Coaching pressures, peer pressure, and self-induced competitive pressure to win will be the factors most strongly associated with performance-enhancer usage among high school female athletes."

Study participants completed a survey that required they rank the importance of nine issues leading to performance-enhancer usage at the high school level. The relationship between the nine issues (independent variables) and level of importance (dependent variables) was analyzed. Our

results indicate that of the nine issues athletes were asked to rank, the pressure to win and self-induced competitive pressures were considered the most important factors leading to performance-enhancer usage. Factors considered important were: Competitive level, pressure by coaches, body image concerns, and pressure by teammates. Pressure by the school, societal pressure, and curiosity were considered only moderately important. These findings suggest that female athletes at the high school level may be engaging in performance-enhancer usage mostly due to the pressure to win and self-induced competitive pressures.

Usage of performance-enhancers appears to be due to a combination of internal and external determinants. According to the subjects surveyed, athletes feel a great pressure to win, which may be due to both self-induced competitive pressures and external pressures by coaches, the school, and teammates. Because top-ranked female athletes often have the self-motivation and desire to win, they may make the conscious decision to engage in usage of performance-enhancers with the hopes of maximizing athletic performance. In addition, if a female athlete has a poor perceived body image, she may engage in usage to obtain what is considered to be the "ideal" body type for success in her particular sport.

Using the Spearman analysis, significant correlations were found between many of the issues. These correlations indicate that athletes who tended to give one issue a certain ranking also tended to give another issue the same

ranking. Specifically, two of the issues shown to have the most significant correlations included: Societal pressures & issues relating to body image; and pressure to win & self-induced competitive pressures. Therefore, some of the athletes surveyed considered these correlating issues to be of equal importance level.

Results of the Kruskal-Wallis Test indicated that there were significant differences ($p \leq .05$) by school in responses for pressure by teammates, pressure by school, pressure by coaches, competitive level, and curiosity/experimentation. When grouped by sport, responses were significantly different for the issues of pressure by teammates, body image, and competitive level.

Demographic data of the school populations may explain results of the quantitative analyses performed. For example, athletes from School 1 and 2 (very competitive schools both academically and athletically) ranked self-induced competitive pressures as the most important factor leading to performance-enhancer usage. Students from both of these academic settings have a high economic level, and ranked higher than the NJ state average for academic standards in Language Arts and Math. Specifically, School 1 was given a score of 100% for the Language Arts component. One can postulate that students from these schools must meet high academic and athletic standards, and therefore may put added pressure on themselves to succeed in both areas.

In addition, athletes from Schools 3, 4, and 6 ranked the pressure to win as the most important factor leading to performance-enhancer usage. These schools were all ranked in the top 1-2% of their respective groups for their particular sport, indicating a possible increased response rate for pressure to win.

Schools with larger populations tend to be more competitive due to the increased number of athletes. Therefore it is not surprising that the athletes from the Group IV schools ranked competitive level as the most important factor.

Significant differences in responses existed for the issues of pressure by teammates, body image, and competitive level. Specifically, swimmers tended to rank body image and competitive level as the most important factors leading to performance-enhancer usage. These results are in agreement with those reported by Spence and Gauvin (1996), where female swimmers were found to consume weight-loss products for performance or appearance purposes.

Further, significant differences among responses by tennis and hockey players were noted as well. The pressure by teammates was ranked much higher in importance by hockey players than by tennis players. This could be attributed to the fact that tennis is primarily an individual sport, with possibly more self-induced competitive pressure than team pressure.

Rankings of importance for pressure by coaches and competitive level were significantly different for each school, and rankings for competitive level were significantly different for each school and sport. This suggests that perhaps coaching style significantly influences an athlete's willingness to engage in performance-enhancer usage; and that athletes with the opportunity to compete at higher levels in various sports (i.e., tennis, swimming, basketball) possibly feel more pressure to engage in usage than those competing at lower levels (i.e., softball).

Limitations of the Study

The purpose of this study was to identify some of the major issues that lead to the usage of performance-enhancers among female athletes at the high school level so that markers for a prevention-education program could be obtained. Limitations of the study design and data analyses caution one against making definite conclusions. As with much survey-based research, potential limitations such as honesty of responses by participants and issues pertaining to external validity may exist.

Although neither the researcher nor the athletic coach was in the classroom at the time of survey completion, the participants may not have felt free to complete the survey honestly. Consequently, the responses reported may not truly reflect the athletes' perspective. Another possible limitation influencing responses is the Hawthorne effect, which involves participants

responding differently than they normally would because they know they are part of a study.

Limitations also exist with external validity. Results from this study may not be generalizable outside New Jersey since the female athletes from this area may not be representative of female athletes everywhere.

Implications for Future Research

This study provides valuable experimental and practical guidelines for future research on performance-enhancer usage among female athletes and has many implications for practice. The survey instrument used in this study may be incorporated into future studies, as it has been tested for content validity by a panel of experts. Also, because this study identified the primary pressures considered to lead to performance-enhancer usage by female athletes, these markers may be used to structure a prevention-education program to be implemented at the high school level.

Student-athletes participating in this form of prevention education must be provided with an organized, logical, theory-based, nonjudgmental, and comprehensive approach to dealing with the internal and external pressures that may lead to unhealthy behaviors such as performance-enhancer usage. Successful prevention-education programs in schools should be continuous, address multiple facets of the students' life, use multiple strategies, and be easily implemented (Kelder et al., 1996).

Two specific theories that may be used to guide the development of performance-enhancer prevention-education programs are the Theory of Planned Behavior (TPB) and Social Cognitive Theory (SCT). The Theory of Planned Behavior explains how attitudes, subjective norms, and perceived behavioral control affect behavioral intention, thereby influencing behavior (Glanz, 1997). This theory is beneficial because it serves as a basis for interventions. Social Cognitive Theory deals with the psychosocial dynamics of the individual, behavior, and environment (Glanz). This theory is useful because a prevention-education program concerning performance-enhancers must address both internal and external (i.e., individual and environmental) factors since in the current study both were ranked as "most important" in leading to usage. Further, SCT is often cited as the predominant model used to design youth health promotion programs because it explains human behavior using a model in which behavior, social-environmental influences, and personal factors (i.e., personality, perceptions, and expectations) interact (Kelder et al., 1996).

While other models of behavior change, such as the Health Belief Model or Transactional Model of Stress and Coping, provide useful guidelines for understanding and modifying unhealthy behaviors, they do not incorporate the social factors that play a key role in performance-enhancer usage (Kelder et al., 1996). Therefore, we believe that the TPB and SCT offer a more comprehensive framework for guiding intervention development. Applying the

TPB and SCT framework to a prevention-education program may explain how an individual's perceived power (TPB) and communication/problem-solving skills (SCT) can affect willingness to refrain from performance-enhancer usage and participate in more pro-social behavior (e.g., problem-solving and positive communication/assertiveness techniques). Although the challenge is great, and no simple solution exists, evidence-based performance-enhancer prevention is essential to the health, well-being and future of young women athletes.

Chapter VI

CONCLUSIONS

In this study, it can be concluded that the pressure to win and self-induced competitive pressures were the two most important factors leading to engagement in performance-enhancer usage. According to the subjects surveyed, athletes feel a great pressure to win, which may be due to both self-induced competitive pressures and external pressures by coaches, the school, and teammates. Because top-ranked female athletes often have the self-motivation and desire to win, they can make the conscious decision to engage in usage of performance-enhancers with the hopes of maximizing athletic performance. In addition, if a female athlete has a low perceived body image, she may engage in usage to obtain what is considered to be the "ideal" body type for success in her particular sport.

Further, due to the internal and external pressures put on high school female athletes, performance-enhancer usage among this population is becoming more prominent. This study has substantiated the need for education on positive coping strategies for dealing with the pressures that young women face at this age. By educating these individuals about self-esteem and the dangers of performance-enhancer usage, we can encourage healthy behaviors.

This study identified the primary pressures considered to lead to performance-enhancer usage by female athletes to be used as markers to structure a prevention-education program at the high school level. The study strongly validates the need for further study on the internal and external pressures of female athletes that can lead to engagement in performance-enhancer usage. Future research may involve surveying the perceptions of female athletes at a variety of high schools throughout the country in order to increase the generalizability of the results found in this study.

Educators and coaches require a valid scientific knowledge base if they are to effectively inform their athletes of the dangers involved in performance-enhancer usage and encourage healthy ways of dealing with the specific pressures felt by athletes at this competitive level. This knowledge base currently does not exist and in part accounts for why this study was primarily descriptive. The responses of the female athletes in this study to the survey items presented have provided some of the first scientific data on the perceptions of the importance of certain internal and external pressures in leading to engagement in performance-enhancer usage.

The descriptive data on the nine issues ranked in terms of importance may enable health educators and coaches to better understand which athletes are more likely to be tempted to engage in performance-enhancer usage, and how to effectively counsel them on dealing with specific pressures in a more

healthy way. This information could be incorporated into athlete education and counseling to facilitate a more individualized approach.

The present study may provide a basis for future studies. It suggests the need for additional research on the internal and external pressures experienced by female athletes at various competitive levels, as well as the need for implementation and evaluation of a prevention-education program tailored to target these specific pressures. These studies may need to incorporate methodologies and sample sizes beyond the scope of this study.

Performance-enhancer usage among female athletes is one topic that is receiving increasingly more attention among the popular literature and has been the subject of television newscasts and talk shows. If health educators and coaches are to have the empowerment to try to prevent the occurrence of usage among this population, it is essential for them to continue to expand their knowledge base on the specific performance-enhancers available and the issues/pressures currently faced by female athletes. The following additional studies are suggested:

(1) Nationwide Surveying of Female Athletes at the High School Level

The present study did not examine athletes outside of the state of New Jersey. However, differences in responses based on school, sport, and demographics of the populations were addressed. By broadening the scope of the current study to include schools from different areas of the United States, one can obtain a more collective view on the perceptions of the

pressures leading to engagement in performance-enhancer usage. It would be very valuable to study the perceptions of female athletes all over the country so that a prevention-education program applicable to many different school settings could be employed nationwide by health educators and coaches.

(2) Implementation and Evaluation of a Performance – Enhancer Prevention-Education Program

The present study was performed to identify markers for a prevention-education program to be performed with female athletes at the high school level. The prevention-education program would target the issues ranked as "most important" in leading to performance-enhancer usage by female athletes engaging in competition at this level. By targeting the issues/pressures behind usage, the program would educate on the dangers involved in taking performance-enhancers as well as how to deal with individualized pressures in a healthy manner. The program would include the implementation of various stress management techniques, communication and assertiveness training, and education on cognitive behavioral therapy and broadening perspectives. Studies on the effectiveness of incorporating this type of program at various school settings would also contribute to the existing knowledge base and facilitate the development of the prevention education needed to foster informed decision-making concerning performance-enhancer usage.

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Appendix A

IRB Study Approval

SETON HALL UNIVERSITY
1 8 5 6

May 11, 2004

Barbara Fralinger
49 Slade Lane
Bridgeton, NJ 08302

Dear Ms Fralinger:

The Seton Hall University Institutional Review Board has reviewed and approved as submitted your research proposal entitled "Female Athletes and Performance-Enhancer Usage". Enclosed for your records are the signed Request for Approval form and the stamped original Consent Forms. Make copies only of this stamped Consent Forms.

The Institutional Review Board approval of your research is valid for a one-year period from the date of this letter. During this time, any changes to the research protocol must be reviewed and approved by the IRB prior to their implementation.

According to federal regulations, continuing review of already approved research is mandated to take place at least 12 months after this initial approval. You will receive communication from the IRB Office for this several months before the anniversary date of your initial approval.

Your protocol has been reviewed and approved under expedited review. The IRB reserves the right at any time to request full review of the study.

Thank you for you cooperation.

Sincerely,

Giuliana Mazzoni, Ph.D.
Associate Professor
Director, Institutional Review Board

C.c.: Geneveive Pinto-Zipp, Ph.D.

Office of Institutional Review Board
Presidents Hall
Tel: 973.275.2974 • Fax: 973.275.2978
400 South Orange Avenue • South Orange, New Jersey 07079-2641

REQUEST FOR APPROVAL OF RESEARCH, DEMONSTRATION OR RELATED ACTIVITIES INVOLVING HUMAN SUBJECTS

All material must be typed.

PROJECT TITLE: *Female Athletes and Performance-Enhancer Usage*

CERTIFICATION STATEMENT:

In making this application, I(we) certify that I(we) have read and understand the University's policies and procedures governing research, development, and related activities involving human subjects. I (we) shall comply with the letter and spirit of those policies. I(we) further acknowledge my(our) obligation to (1) obtain written approval of significant deviations from the originally-approved protocol BEFORE making those deviations, and (2) report immediately all adverse effects of the study on the subjects to the Director of the Institutional Review Board, Seton Hall University, South Orange, NJ 07079.

Barbara K. Fralinger, MEd *Barbara K. Fralinger, M.Ed* 3/31/04
RESEARCHER(S) OR PROJECT DIRECTOR(S) DATE

**Please print or type out names of all researchers below signature.
Use separate sheet of paper, if necessary.**

My signature indicates that I have reviewed the attached materials and consider them to meet IRB standards.

Dr. Genevelve Pinto-Zipp *Genevieve Pinto Zipp* 3-31-04
RESEARCHER'S ADVISOR OR DEPARTMENTAL SUPERVISOR DATE

Please print or type out name below signature

The request for approval submitted by the above researcher(s) was considered by the IRB for Research Involving Human Subjects Research at the *in May 2004* meeting.

The application was approved ✓ not approved ___ by the Committee. Special conditions were ___ were not ✓ set by the IRB. (Any special conditions are described on the reverse side.)

[signature] 5.11.04
DIRECTOR, DATE
SETON HALL UNIVERSITY INSTITUTIONAL
REVIEW BOARD FOR HUMAN SUBJECTS RESEARCH

APPROVED
MAY 11 2004
IRB
SETON HALL UNIVERSITY

Seton Hall University
02/2003

TOTAL P.02

03/31/04

SETON HALL UNIVERSITY
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INFORMED CONSENT FORM

Dear Parent/Guardian,

My name is Barbara Fralinger and I am a doctoral student with the School of Graduate Medical Education at Seton Hall University. I am currently earning my PhD in Health Science Education, specializing in Health Professions Leadership. For my research, I am investigating the perceptions of high school female athletes on the usage of performance-enhancers (i.e. steroids, amphetamines, etc.) among this population in order to develop a prevention education program at this level. I am writing to ask your permission to let your child participate in this research. Allow me to explain this project to you.

Purpose and Duration of the Research
The purpose of this research is to determine the major issues that lead to the usage of steroids and other performance-enhancers among high school female athletes through use of a survey. The expected duration of your child's participation will be approximately ten minutes, however, a thirty-minute timeframe will be allotted.

Description of Procedures
The procedures of this research involve the distribution of a survey before a team practice session. Your child will be asked to complete the survey and return it for tabulation of results. You and your child may contact the researcher regarding aggregate data obtained from the study.

Participation is Voluntary
Your child's participation is strictly voluntary. She does not have to participate and can decide to stop at anytime - there will be no negative consequences for that decision. I emphasize to you that your child will in no way be penalized for not participating or for deciding to stop once she has started.

Protecting Your Child's Identity
Your child will not be identified at any time during the research. Surveys will be administered and returned anonymously. At no time will your child be asked to state her name on the questionnaire. No coaches or school personnel will have access to your child's survey responses, as they will not take part in this investigation.
Note: Your child's consent to participate will be indicated by completing and returning the anonymous survey.

School of Graduate Medical Education
Department of Graduate Programs in Health Sciences
Tel: 973.275.2076 • Fax: 973.275.2370 • TDD: 973.275.2169
400 South Orange Avenue • South Orange, New Jersey 07079 • *gradmeded.shu.edu*

SETON HALL UNIVERSITY
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Data Will Be Kept Confidential
All information collected in the study is confidential and will be securely stored in a locked cabinet to which only I will have access. The data provided will be grouped with data others provide for reporting and presentation. No one but the researcher will have access to research records. Data will be stored separately from the consent forms, keeping your child's answers confidential.

There are No Risks or Discomforts
There are no risks to your child's health from this study at any time.

Benefits for Participating
This study is intended to benefit both female athletes and coaches by providing information about the potential mental, physical, and social factors that can lead to the abuse of steroids and other performance-enhancers among female athletes. As a result of this research, possible solutions and prevention education programs for decreasing performance-enhancer usage among female athletes may be developed.

Contact Information
If you have any questions regarding this study, you can contact me by calling the Seton Hall University Graduate Medical Education Department at 973-275-2076. I would be happy to answer your questions.

Approval of the Institutional Review Board
This project has been reviewed and approved by the Seton Hall University Institutional Review Board for Human Subjects research. The IRB believes that the research procedures adequately safeguard your child's privacy, welfare, civil liberties, and rights. The Chairperson of the IRB may be reached at (973) 275-2977 or 313-6314.

I have read the material above, and any questions I asked have been answered to my satisfaction. I agree to allow my child to participate in this activity, realizing that she may choose to participate and may also withdraw without prejudice at any time.

_____ _____
Parent/Guardian Signature Date

Please sign and return one copy of the above consent form. The other copy is for you to keep. Thank you.

APPROVED
MAY 11 2004
IRB
SETON HALL UNIVERSITY

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Female Athletes and Performance Enhancer Usage
Student-Athlete Survey

Directions: Please rate the following issues in terms of their importance in leading to steroid/ performance-enhancer usage among female athletes. Ratings are on a scale of 1 through 5:

1=very important
2=important
3=moderately important
4=unimportant
5=most unimportant

**Please circle the number that you feel is most appropriate for each issue.

Issues Related to Performance-Enhancer Usage	Rating				
The pressure to win	1	2	3	4	5
Peer pressure by teammates	1	2	3	4	5
Pressure by the school to win	1	2	3	4	5
Self-induced competitive pressures	1	2	3	4	5
Conscious or unconscious pressure by coaches	1	2	3	4	5
Issues relating to body image	1	2	3	4	5
Societal pressures (i.e. media, TV advertisements)	1	2	3	4	5
Competitive Level (Group I, II, III, IV)	1	2	3	4	5
Curiosity/Experimentation	1	2	3	4	5

Is there anything that you would add to the above list? If so, please list here.

_____

_____

Additional Comments:

**Would you like to receive results of all the data obtained from this survey? If so, please call the Seton Hall Dept. of Graduate Medical Education at 973-275-2076 for information.

School of Graduate Medical Education
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LETTER OF INVITATION

May 20, 2004

Name

Address

Dear Coach:

Based on your athletic team's outstanding win-loss record, I would like to ask you to participate in a study regarding the assessment of high school female athletes that is being conducted, under the direction of Dr. Genevieve Pinto-Zipp, in fulfillment of doctoral degree requirements at Seton Hall University. The purpose of this study is to determine the major issues that lead to the usage of steroids and other performance-enhancers among high school female athletes so that markers can be identified for a future prevention education program.

A review of the literature on this topic suggests that despite the vast amount of knowledge on the harmful physical and mental effects of steroids, a high number of high school athletes engage in regular use of these substances, with an increasing number of athletes being women. In addition, it has been found that female athletes are also using performance-enhancers such as creatine for energy boosts and improvement of muscle mass. Due to these findings, it appears that there is a need to find the reasons for the increase in steroid/performance-enhancer usage among women athletes.

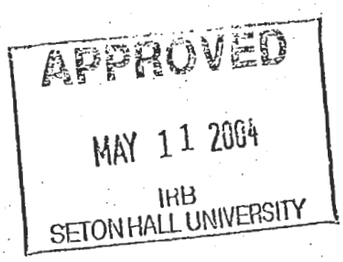
In order to gather information for this study, I am asking that you send the enclosed package of information to the parents of your athletes in order to gain parental consent. I would then like to administer a survey to the athletes who have obtained parental consent prior to a team practice at your convenience. Your athletes' input would be valuable in

this attempt to determine some issues relating to performance-enhancer usage by female athletes. Participation in this research involves one survey, taking approximately 10 minutes to complete (athletes will be given up to 30 minutes for completion if necessary). At no time will team members be asked to state their name or describe their own behaviors. Rather, we are interested in their perceptions as female high school athletes. After survey analysis, I will provide you with a summary of the aggregated data if you so desire. This project has been reviewed and approved by the Seton Hall University Institutional Review Board for Human Subjects research. The IRB believes that the research procedures adequately safeguard your athlete's privacy, welfare, civil liberties, and rights.

If you would like clarification regarding this request or the nature of my study, please do not hesitate to contact me at 856-451-2343 or my advisor, Dr. Genevieve Pinto-Zipp at 973-275-2457. Thank you very much for your consideration and commitment.

Sincerely,

Barbara K. Fralinger



Appendix B

Definitions

1) Alcohol- **a:** ethanol especially when considered as the intoxicating agent in fermented and distilled liquors **b:** drink (as whiskey or beer) containing ethanol **c:** a mixture of ethanol and water that is usually 95 percent ethanol (Merriam-Webster, 2003).

2) Amphetamines- a large and varied group of synthetic agents that stimulate the central nervous system (Donatelle, 2002).

3) Anabolic Steroids- artificial forms of the hormone testosterone that promote muscle growth and strength (Donatelle, 2002).

4) Athlete - a person who is trained or skilled in exercises, sports, or games requiring

physical strength, agility, or stamina (Merriam-Webster, 2003).

5) Caffeine- A stimulant found in coffee, tea, chocolate, and some soft drinks (Donatelle, 2002).

6) Cocaine- a powerful stimulant drug made from the leaves of the South American coca shrub (Donatelle, 2002).

7) Creatine – a naturally occurring compund found primarily in skeletal muscle that helps optimize the muscles' energy levels (Donatelle, 2002); a nutritional supplement that causes water retention in muscles and increased bursts of energy for workouts or competition (Millman & Ross, 2003).

8) Ergogenic drug – substance that enhances athletic performance (Donatelle, 2002).

9) Human Growth Hormone- secreted by the anterior lobe of the pituitary gland. It stimulates growth of bone and essentially all tissues of the body by stimulating protein synthesis and breaking down fat to provide energy (Donatelle, 2002).

10) Marijuana- Chopped leaves and flowers of the cannabis indica or cannabis sativa plant (hemp); a psychoactive stimulant that intensifies reactions to environmental stimuli (Donatelle, 2002).

11) Nutritional Supplement- something that completes or makes an addition (e.g. dietary supplements) (Merriam-Webster, 2003).

12) Performance-enhancer- a substance taken to heighten or increase athletic performance; ergogenic drugs that are introduced to the body to provide an additional physical "edge" for an athlete engaging in competition (Donatelle, 2002).

13) Testosterone- The male sex hormone manufactured in the testes (Donatelle, 2002).

14) Tobacco- any of a genus (*Nicotiana*) of chiefly American plants of the nightshade family with viscid foliage and tubular flowers; *especially* **:** a tall erect annual tropical American herb (*N. tabacum*) cultivated for its leaves **2 :** the leaves of cultivated tobacco prepared for use in smoking or chewing or as snuff (Merriam-Webster, 2003).

Appendix C

Delphi Pilot Validity Study

Background

The Delphi technique is a process that facilitates consensus building and informed decision-making among experts in a field. It is one of several group techniques where individual judgments are combined to arrive at informed decisions that cannot be made by one person and for which there is insufficient scientific information or an overload of contradictory information. There are four combined characteristics that distinguish the Delphi technique from other group decision-making processes: anonymity, iteration with controlled feedback, statistical group response, and "expert" input (Goodman, 1987; Chocholik et al., 1999). The Delphi technique may be used when one or more of the following occurs: a problem cannot be solved by analytic technique alone, but requires subjective judgment on a collective basis; the contributing individuals represent a diversity of experience and expertise; frequent meetings are not feasible; disagreements among individuals are so severe or politically charged that anonymity must be ensured; and the effectiveness of face-to-face meetings can be increased by a supplemental group process, i.e., avoidance of the "bandwagon" or "groupthink" effect (Linstone & Turoff, 1975; Chocholik et al., 1999). The use of this technique is dependent on the lack of agreement or incomplete state of knowledge

concerning either the nature of the problem or the components that must be included in a successful solution (Chocolik, 1999).

In the pilot study, group consensus was achieved through the administration of successive rounds of questionnaires in which opinions were gathered. Members of the group submitted their opinions independently and confidentially through responses to the questionnaires. The first round was open-ended or exploratory and was designed to obtain information about drug/performance-enhancer usage among female athletes. Three successive rounds involved questionnaires that incorporated opinions from the previous round and statistical indicators (i.e., the mean and standard deviations) of previous responses. The process involved four total rounds, and results were tabulated and shared with the participants after each round. Upon examination of group feedback on the issues leading to performance-enhancer usage, the coaches modified their opinions, rankings, priorities, and so on in response to new information, modification of thought, or other reasons and events. The process was completed when a convergence of opinion occurred on the major issues leading to performance-enhancer usage, as indicated by a small standard deviation in mean responses.

Validity Study Results

The content validity study conducted by the panel of six expert coaches included a four-round Delphi survey. Issues pertaining to performance-enhancer usage by female athletes were generated and consequently rated

in terms of importance by the panel until a consensus was reached on the most significant issues. Consensus among experts was determine through analysis of the standard deviation of responses; the lower the standard deviation, the higher the consensus of the panel on the rating of importance of issues potentially leading to performance-enhancer usage.

Analysis of Results

Pilot study results were analyzed by examining the means and standard deviations of responses after each round. Results were as follows:

Round 1.

Most panelists agreed that drug usage is a cause for concern among collegiate female athletes. When asked which drugs were of biggest overall concern at the college level, four out of the six panelists listed alcohol. However, five panelists listed either steroids or creatine (a well-known performance-enhancer) as a major concern as well. This finding adds support to the results found in the literature, which indicate that usage of performance-enhancers among collegiate female athletes is on the rise. When asked which drugs were of biggest concern to them with regard to their particular campus/team, a majority of the panelists listed either alcohol or marijuana.

In addition, panelists were asked to give some reasons that female athletes may be engaging in drug usage. Five coaches listed peer pressure

or social acceptance as a major contributor. Also, competitive pressures, experimentation, and body image were given as some top reasons as well. These responses support the literature findings that peer pressure combined with competitive pressures and dissatisfaction with body image can potentially lead to increased substance abuse.

Regarding steroids/performance-enhancers, most panelists agreed that collegiate female athletic coaches did not support engagement in usage. However, one panelist stated that there could be possible indirect encouragement from coaches due to high expectations for performance and pressure to win. Overall, the coaches felt that if usage was occurring at the NCAA Division III or NJCAA level, it was due to self-induced competitive pressures, college/university pressures to win, or pressure from teammates. However, when asked about division membership, all panelists said that more steroid/performance-enhancer usage may be encouraged at the Division I or II level due to increased competitive pressures or issues surrounding scholarship money; because Division III institutions cannot give athletic scholarships, female athletes at this level do not have that added pressure.

Round 2.

Issues relating to steroid/performance-enhancer usage were rated on a significance scale of 1-5, with 1 being the most significant and 5 being the most insignificant. Results indicated that Delphi panelists considered self-

induced competitive pressures, competitive level, and the pressure to win to be the most significant factors leading to steroid/performance-enhancer usage in collegiate female athletes. In addition, university pressures, pressure by teammates/coaches, and issues relating to body image were considered significant, while societal pressures and curiosity were the most insignificant factors.

Round 3.

Issues relating to steroid/performance-enhancer usage were rated on a significance scale of 1-5, with 1 being the most significant and 5 being the most insignificant. Results of Round 3 indicated that Delphi panelists considered self-induced competitive pressures and competitive level to be the most significant factors leading to steroid/performance-enhancer usage in collegiate female athletes. In addition, the pressure to win, university were considered significant, while societal pressures, pressure by teammates, and curiosity were considered moderately significant. The standard deviation for each response decreased from Round 2, indicating more of a consensus among respondents.

When questioned about the circumstances under which the coaches felt drug usage occurs, most respondents stated that competitive pressures, peer influences, and body image were the major contributors to drug/performance-enhancer usage. When asked how they, as coaches, could overcome some of these circumstances, the majority of respondents stated that they would

implement some form of educational/counseling program that would involve trained professionals (e.g. nutritionists) coming in and talking to the athletes about overall drug usage and proper nutrition and strength training.

In addition, when asked about circumstances under which particular pressures (i.e. university, teammates, coaches, peers) occur with female athletes, respondents frequently noted self-induced competitive pressures and university pressure to win as the most influential factors. The pressure that athletes put on themselves combined with the pressure to continue the winning tradition at competitive institutions can possibly facilitate more engagement in steroid/performance-enhancer usage. To address these issues within their particular programs, respondents stated that through implementation of educational programs, strict adherence to NCAA and NJCAA regulations, and enforcement of penalties, coaches can discourage steroid/performance-enhancer usage among female athletes.

Round 4.

Issues relating to steroid/performance-enhancer usage were rated on a significance scale of 1-5, with 1 being the most significant and 5 being the most insignificant. Results of Round 4 indicated that Delphi panelists considered self-induced competitive pressures and competitive level to be the most significant factors leading to steroid/performance-enhancer usage in collegiate female athletes. In addition, the pressure to win, university

pressures, pressure by teammates/coaches, and issues relating to body image were considered significant, while societal pressures, pressure by teammates, conscious/unconscious pressure by coaches, and curiosity were the considered moderately significant. The standard deviation of responses for questions 2 and 3 (peer pressure by teammates, university pressures) decreased from Round 3, while questions 5 and 8 (conscious/unconscious pressures by coaches, competitive level) showed an increase. All other deviations remained the same. Overall, these results indicated more of a consensus among respondents.

Appendix D

SPSS Statistical Analyses

Chi-Square Test

Frequencies.

PRESSWIN

	Observed N	Expected N	Residual
1.00	57	24.4	32.6
2.00	33	24.4	8.6
3.00	20	24.4	-4.4
4.00	7	24.4	-17.4
5.00	5	24.4	-19.4
Total	122		

PRESTEAM

	Observed N	Expected N	Residual
1.00	11	24.4	-13.4
2.00	33	24.4	8.6
3.00	43	24.4	18.6
4.00	25	24.4	.6
5.00	10	24.4	-14.4
Total	122		

PRESSCHO

	Observed N	Expected N	Residual
1.00	9	24.4	-15.4
2.00	29	24.4	4.6
3.00	37	24.4	12.6
4.00	35	24.4	10.6
5.00	12	24.4	-12.4
Total	122		

COMPRES

	Observed N	Expected N	Residual
1.00	58	24.4	33.6
2.00	29	24.4	4.6
3.00	18	24.4	-6.4
4.00	9	24.4	-15.4
5.00	8	24.4	-16.4
Total	122		

PRESCOAC

	Observed N	Expected N	Residual
1.00	30	24.4	5.6
2.00	33	24.4	8.6
3.00	37	24.4	12.6
4.00	16	24.4	-8.4
5.00	6	24.4	-18.4
Total	122		

BODYIMAG

	Observed N	Expected N	Residual
1.00	27	24.4	2.6
2.00	28	24.4	3.6
3.00	35	24.4	10.6
4.00	20	24.4	-4.4
5.00	12	24.4	-12.4
Total	122		

SOCPRESS

	Observed N	Expected N	Residual
1.00	11	24.4	-13.4
2.00	22	24.4	-2.4
3.00	38	24.4	13.6
4.00	28	24.4	3.6
5.00	23	24.4	-1.4
Total	122		

COMPLEV

	Observed N	Expected N	Residual
1.00	47	24.4	22.6
2.00	35	24.4	10.6
3.00	23	24.4	-1.4
4.00	6	24.4	-18.4
5.00	11	24.4	-13.4
Total	122		

CURIOUS

	Observed N	Expected N	Residual
1.00	11	24.4	-13.4
2.00	21	24.4	-3.4
3.00	34	24.4	9.6
4.00	28	24.4	3.6
5.00	28	24.4	3.6
Total	122		

Test Statistics

	PRESSWIN	PRESTEAM	PRESSCHO	COMPRES	PRESCOAC	BODYIMAG	SOCPRESS	COMPLEV	CURIOUS
Chi-Square[a]	75.213	33.082	28.000	69.557	27.590	12.508	15.787	46.852	12.672
df	4	4	4	4	4	4	4	4	4
Asymp. Sig.	.000	.000	.000	.000	.000	.014	.003	.000	.013

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 24.4.

Nonparametric correlations

Correlations

			PRESSWIN	PRESTEAM	PRESSCHO	COMPRES	PRESCOAC	BODYIMAG	SOCPRESS	COMPLEV	CURIOUS	SCHOOL	SPORT
Spearman's rho	PRESSWIN	Correlation Coefficien	1.000	.284**	.196*	.437**	.417**	.226*	.066	.319**	.117	-.051	-.037
		Sig. (2-tailed)	.	.001	.031	.000	.000	.012	.468	.000	.200	.573	.687
		N	122	122	122	122	122	122	122	122	122	122	122
	PRESTEAM	Correlation Coefficien	.284**	1.000	.424**	.224*	.396**	.161	.016	.101	.248**	.201*	.068
		Sig. (2-tailed)	.001	.	.000	.013	.000	.077	.859	.266	.006	.026	.459
		N	122	122	122	122	122	122	122	122	122	122	122
	PRESSCHO	Correlation Coefficien	.196*	.424**	1.000	.232**	.390**	.148	.272**	.210*	.269**	.028	-.090
		Sig. (2-tailed)	.031	.000	.	.010	.000	.104	.002	.020	.003	.758	.322
		N	122	122	122	122	122	122	122	122	122	122	122
	COMPRES	Correlation Coefficien	.437**	.224*	.232**	1.000	.429**	.200*	.087	.231*	.223*	.042	-.007
		Sig. (2-tailed)	.000	.013	.010	.	.000	.027	.338	.011	.013	.645	.937
		N	122	122	122	122	122	122	122	122	122	122	122
	PRESCOAC	Correlation Coefficien	.417**	.396**	.390**	.429**	1.000	.263**	.110	.267**	.299**	.199*	-.013
		Sig. (2-tailed)	.000	.000	.000	.000	.	.003	.228	.003	.001	.028	.890
		N	122	122	122	122	122	122	122	122	122	122	122
	BODYIMAG	Correlation Coefficien	.226*	.161	.148	.200*	.263**	1.000	.516**	.058	.037	.210*	.201*
		Sig. (2-tailed)	.012	.077	.104	.027	.003	.	.000	.523	.682	.020	.026
		N	122	122	122	122	122	122	122	122	122	122	122
	SOCPRESS	Correlation Coefficien	.066	.016	.272**	.087	.110	.516**	1.000	.167	.137	-.054	-.047
		Sig. (2-tailed)	.468	.859	.002	.338	.228	.000	.	.065	.131	.553	.606
		N	122	122	122	122	122	122	122	122	122	122	122
	COMPLEV	Correlation Coefficien	.319**	.101	.210*	.231*	.267**	.058	.167	1.000	.121	-.202*	-.202*
		Sig. (2-tailed)	.000	.266	.020	.011	.003	.523	.065	.	.185	.026	.026
		N	122	122	122	122	122	122	122	122	122	122	122
	CURIOUS	Correlation Coefficien	.117	.248**	.269**	.223*	.299**	.037	.137	.121	1.000	-.185*	-.130
		Sig. (2-tailed)	.200	.006	.003	.013	.001	.682	.131	.185	.	.042	.154
		N	122	122	122	122	122	122	122	122	122	122	122
	SCHOOL	Correlation Coefficien	-.051	.201*	.028	.042	.199*	.210*	-.054	-.202*	-.185*	1.000	.601**
		Sig. (2-tailed)	.573	.026	.758	.645	.028	.020	.553	.026	.042	.	.000
		N	122	122	122	122	122	122	122	122	122	122	122
	SPORT	Correlation Coefficien	-.037	.068	-.090	-.007	-.013	.201*	-.047	-.202*	-.130	.601**	1.000
		Sig. (2-tailed)	.687	.459	.322	.937	.890	.026	.606	.026	.154	.000	.
		N	122	122	122	122	122	122	122	122	122	122	122

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

Kruskal-Wallis One Way Analysis of Variance – Grouping by School

Ranks

	SCHOOL	N	Mean Rank
PRESSWIN	1.00	8	73.38
	2.00	15	67.50
	3.00	34	57.78
	4.00	8	51.00
	5.00	11	63.68
	6.00	17	62.97
	7.00	29	60.69
	Total	122	
PRESTEAM	1.00	8	39.94
	2.00	15	48.00
	3.00	34	55.50
	4.00	8	86.31
	5.00	11	71.45
	6.00	17	82.62
	7.00	29	58.47
	Total	122	
PRESSCHO	1.00	8	62.25
	2.00	15	62.50
	3.00	34	51.21
	4.00	8	67.31
	5.00	11	83.32
	6.00	17	78.24
	7.00	29	53.16
	Total	122	
COMPRES	1.00	8	61.75
	2.00	15	54.97
	3.00	34	60.21
	4.00	8	71.00
	5.00	11	53.73
	6.00	17	75.74
	7.00	29	58.31
	Total	122	
PRESSCOAC	1.00	8	61.00
	2.00	15	49.70
	3.00	34	50.75
	4.00	8	48.00
	5.00	11	80.45
	6.00	17	87.38
	7.00	29	61.71
	Total	122	
BODYIMAG	1.00	8	46.44
	2.00	15	39.97
	3.00	34	61.43
	4.00	8	83.38
	5.00	11	64.09
	6.00	17	68.85
	7.00	29	65.55
	Total	122	
SOCPRESS	1.00	8	65.81
	2.00	15	61.60
	3.00	34	65.03
	4.00	8	76.88
	5.00	11	37.36
	6.00	17	61.76
	7.00	29	60.88
	Total	122	
COMPLEV	1.00	8	97.19
	2.00	15	59.07
	3.00	34	63.72
	4.00	8	51.31
	5.00	11	45.50
	6.00	17	80.94
	7.00	29	47.79
	Total	122	
CURIOUS	1.00	8	52.31
	2.00	15	73.50
	3.00	34	64.63
	4.00	8	61.19
	5.00	11	76.86
	6.00	17	72.74
	7.00	29	41.83
	Total	122	

Test Statistics[a,b]

	PRESSWIN	PRESTEAM	PRESSCHO	COMPRES	PRESCOAC	ODYIMAG	SOCPRESS	COMPLEV	CURIOUS
Chi-Square	2.864	18.590	13.625	5.321	19.514	11.865	7.522	22.774	16.134
df	6	6	6	6	6	6	6	6	6
Asymp. Sig.	.826	.005	.034	.503	.003	.065	.275	.001	.013

a. Kruskal Wallis Test

b. Grouping Variable: SCHOOL

Kruskal-Wallis One Way Analysis of Variance – Grouping by Sport

Ranks

	SPORT	N	Mean Rank
PRESSWIN	1.00	8	73.38
	2.00	15	67.50
	3.00	45	57.97
	4.00	11	63.68
	5.00	22	52.57
	6.00	21	68.48
	Total	122	
PRESTEAM	1.00	8	39.94
	2.00	15	48.00
	3.00	45	70.54
	4.00	11	71.45
	5.00	22	56.07
	6.00	21	60.45
	Total	122	
PRESSCHO	1.00	8	62.25
	2.00	15	62.50
	3.00	45	63.30
	4.00	11	83.32
	5.00	22	53.57
	6.00	21	53.52
	Total	122	
COMPRES	1.00	8	61.75
	2.00	15	54.97
	3.00	45	67.08
	4.00	11	53.73
	5.00	22	54.86
	6.00	21	65.14
	Total	122	
PRESCOAC	1.00	8	61.00
	2.00	15	49.70
	3.00	45	67.54
	4.00	11	80.45
	5.00	22	47.43
	6.00	21	61.98
	Total	122	
BODYIMAG	1.00	8	46.44
	2.00	15	39.97
	3.00	45	66.99
	4.00	11	64.09
	5.00	22	57.07
	6.00	21	74.14
	Total	122	
SOCPRESS	1.00	8	65.81
	2.00	15	61.60
	3.00	45	66.07
	4.00	11	37.36
	5.00	22	60.20
	6.00	21	64.00
	Total	122	
COMPLEV	1.00	8	97.19
	2.00	15	59.07
	3.00	45	63.48
	4.00	11	45.50
	5.00	22	65.48
	6.00	21	49.62
	Total	122	
CURIOUS	1.00	8	52.31
	2.00	15	73.50
	3.00	45	61.72
	4.00	11	76.86
	5.00	22	65.80
	6.00	21	43.40
	Total	122	

Test Statistics[a,b]

	PRESSWIN	PRESTEAM	PRESSCHO	COMPRES	PRESCOAC	ODYIMAG	SOCPRESS	COMPLEV	CURIOUS
Chi-Square	4.631	10.267	6.955	3.612	10.301	11.798	6.489	14.544	10.722
df	5	5	5	5	5	5	5	5	5
Asymp. Sig	.463	.068	.224	.607	.067	.038	.262	.012	.057

a. Kruskal Wallis Test

b. Grouping Variable: SPORT

Post-Hoc Test

Scheffe Test for Grouping by School.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
PRESSWIN	Between Groups	.922	6	.154	.119	.994
	Within Groups	148.554	115	1.292		
	Total	149.475	121			
PRESTEAM	Between Groups	22.571	6	3.762	3.647	.002
	Within Groups	118.610	115	1.031		
	Total	141.180	121			
PRESSCHO	Between Groups	15.391	6	2.565	2.245	.044
	Within Groups	131.428	115	1.143		
	Total	146.820	121			
COMPRES	Between Groups	8.937	6	1.489	.979	.443
	Within Groups	175.030	115	1.522		
	Total	183.967	121			
PRESCOAC	Between Groups	24.818	6	4.136	3.562	.003
	Within Groups	133.551	115	1.161		
	Total	158.369	121			
BODYIMAG	Between Groups	18.199	6	3.033	2.005	.071
	Within Groups	173.965	115	1.513		
	Total	192.164	121			
SOCPRESS	Between Groups	9.722	6	1.620	1.103	.365
	Within Groups	168.901	115	1.469		
	Total	178.623	121			
COMPLEV	Between Groups	37.674	6	6.279	4.760	.000
	Within Groups	151.711	115	1.319		
	Total	189.385	121			
CURIOUS	Between Groups	25.328	6	4.221	2.926	.011
	Within Groups	165.893	115	1.443		
	Total	191.221	121			

Multiple Comparisons

Scheffe

Dependent Variable	(I) SCHOOL	(J) SCHOOL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
PRESSWIN	1.00	2.00	5.833E-02	.4876	1.000	-1.7406	1.8572
		3.00	.1838	.4466	1.000	-1.4308	1.7985
		4.00	.2500	.5683	1.000	-1.8045	2.3045
		5.00	.2159	.5281	1.000	-1.8934	2.1252
		6.00	.1838	.4673	1.000	-1.5779	1.9455
		7.00	.2874	.4539	.999	-1.3435	1.9384
	2.00	1.00	-5.8333E-02	.4876	1.000	-1.8572	1.7406
		3.00	.1255	.3523	1.000	-1.1482	1.3991
		4.00	.1917	.4976	1.000	-1.8072	1.9906
		5.00	.1576	.4512	1.000	-1.4735	1.7887
		6.00	.1255	.4026	1.000	-1.3301	1.5811
		7.00	.2391	.3615	.999	-1.0677	1.5459
	3.00	1.00	-.1838	.4466	1.000	-1.7985	1.4308
		2.00	-.1255	.3523	1.000	-1.3991	1.1482
		4.00	6.618E-02	.4466	1.000	-1.5485	1.6808
		5.00	3.208E-02	.3942	1.000	-1.3932	1.4574
		6.00	.0000	.3378	1.000	-1.2206	1.2206
		7.00	.1136	.2873	1.000	-.9251	1.1522
	4.00	1.00	-.2500	.5683	1.000	-2.3045	1.8045
		2.00	-.1917	.4976	1.000	-1.9906	1.8072
		3.00	-6.6176E-02	.4466	1.000	-1.6808	1.5485
		5.00	-3.4091E-02	.5281	1.000	-1.9434	1.8752
		6.00	-6.6176E-02	.4673	1.000	-1.8279	1.8955
		7.00	4.741E-02	.4539	1.000	-1.5835	1.6884
	5.00	1.00	-.2159	.5281	1.000	-2.1252	1.8934
		2.00	-.1576	.4512	1.000	-1.7887	1.4735
		3.00	-3.2086E-02	.3942	1.000	-1.4574	1.3932
		4.00	3.409E-02	.5281	1.000	-1.8752	1.9434
		6.00	-3.2086E-02	.4398	1.000	-1.6221	1.5578
		7.00	8.150E-02	.4025	1.000	-1.3735	1.5365
	6.00	1.00	-.1838	.4673	1.000	-1.8455	1.5779
		2.00	-.1255	.4026	1.000	-1.5811	1.3301
		3.00	.0000	.3378	1.000	-1.2206	1.2206
		4.00	6.618E-02	.4673	1.000	-1.8955	1.8279
		5.00	3.208E-02	.4398	1.000	-1.5578	1.6221
		7.00	.1136	.3472	1.000	-1.1415	1.3687
	7.00	1.00	-.2874	.4539	.999	-1.9384	1.3435
		2.00	-.2391	.3615	.998	-1.5459	1.0677
		3.00	-.1136	.2873	1.000	-1.1522	.9251
		4.00	-4.7414E-02	.4539	1.000	-1.8864	1.5935
		5.00	-8.150E-02	.4025	1.000	-1.5365	1.3735
		6.00	-.1136	.3472	1.000	-1.3687	1.1415
PRESTEAM	1.00	2.00	-.1500	.4446	1.000	-1.7574	1.4574
		3.00	-.5147	.3991	.947	-1.9575	.8281
		4.00	-1.5000	.5078	.200	-3.3358	.3358
		5.00	-.8316	.4719	.690	-2.6379	.7742
		6.00	-1.3382	.4354	.161	-2.9124	.2359
		7.00	-.5776	.4056	.915	-2.0438	.8887
	2.00	1.00	.1500	.4446	1.000	-1.4574	1.7574
		3.00	-.3647	.3148	.996	-1.5028	.7734
		4.00	-1.3500	.4448	.172	-2.9574	.2574
		5.00	-.7818	.4031	.708	-2.2393	.6758
		6.00	-1.1882	.3598	.102	-2.4888	.1124
		7.00	-.4276	.3230	.940	-1.5953	.7401
	3.00	1.00	.5147	.3991	.947	-.8281	1.9575
		2.00	.3647	.3148	.996	-.7734	1.5028
		4.00	-.9853	.3991	.419	-2.4281	.4575
		5.00	-.4171	.3523	.995	-1.6907	.8565
		6.00	-.8235	.3017	.290	-1.9142	.2871
		7.00	-6.2860E-02	.2587	1.000	-.8910	.8652
	4.00	1.00	1.5000	.5078	.200	-.3358	3.3358
		2.00	1.3500	.4448	.172	-.2574	2.9574
		3.00	.9853	.3991	.419	-.4575	2.4281
		5.00	.5682	.4719	.982	-1.1379	2.2742
		6.00	.1618	.4354	1.000	-1.4124	1.7359
		7.00	.5224	.4056	.825	-.5438	2.3887
	5.00	1.00	.8316	.4719	.690	-.7742	2.6379
		2.00	.7818	.4031	.708	-.6758	2.2393
		3.00	.4171	.3523	.995	-.8565	1.6907
		4.00	-.5682	.4719	.982	-2.2742	1.1379
		6.00	-.4064	.3930	.992	-1.8271	1.0143
		7.00	.3542	.3596	.998	-.9459	1.6544
	6.00	1.00	1.3382	.4354	.161	-.2359	2.9124
		2.00	1.1882	.3598	.102	-.1124	2.4888
		3.00	.8235	.3017	.290	-.2871	1.9142
		4.00	.1618	.4354	1.000	-1.7359	1.4124
		5.00	.4064	.3930	.992	-1.0143	1.8271
		7.00	.7606	.3102	.428	-.3609	1.8822
	7.00	1.00	.5776	.4056	.915	-.8887	2.0438
		2.00	.4276	.3230	.940	-.7401	1.5953
		3.00	6.286E-02	.2587	1.000	-.8652	.9910
		4.00	-.5224	.4056	.825	-2.3887	.5438
		5.00	-.3542	.3596	.998	-1.6544	.9459
		6.00	-.7606	.3102	.428	-1.8822	.3609
PRESSCHO	1.00	2.00	-8.3333E-03	.4680	1.000	-1.7004	1.6837
		3.00	.3603	.4201	.993	-1.1584	1.8790
		4.00	-.1250	.5345	1.000	-2.0575	1.8075
		5.00	-.8932	.4987	.923	-2.4880	1.1027
		6.00	-.4632	.4583	.994	-2.1203	1.1938
		7.00	.2629	.4289	.999	-1.2805	1.8064
	2.00	1.00	8.333E-03	.4680	1.000	-1.6837	1.7004
		3.00	.3686	.3314	.674	-.8294	1.5666
		4.00	-.1167	.4680	1.000	-1.8087	1.5754
		5.00	-.8848	.4244	.855	-2.2191	.8494
		6.00	-.4548	.3787	.962	-1.8240	.9142
		7.00	.2713	.3400	.998	-.9579	1.5005
	3.00	1.00	-.3603	.4201	.993	-1.8790	1.1584
		2.00	-.3686	.3314	.974	-1.5666	.8294
		...	...	...	...	...	...
		5.00	-1.0535	.3706	.243	-2.3941	.2872
		6.00	-.8235	.3178	.355	-1.9716	.3245
		7.00	-9.7363E-02	.2702	1.000	-1.0743	.8796
	4.00	1.00	.1250	.5345	1.000	-1.8075	2.0575
		2.00					

PRESSWIN

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05
		1
7.00	29	1.8276
4.00	8	1.8750
5.00	11	1.9091
3.00	34	1.9412
6.00	17	1.9412
2.00	15	2.0667
1.00	8	2.1250
Sig.		.998

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

PRESTEAM

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05	
		1	2
1.00	8	2.2500	
2.00	15	2.4000	2.4000
3.00	34	2.7647	2.7647
7.00	29	2.8276	2.8276
5.00	11	3.1818	3.1818
6.00	17	3.5882	3.5882
4.00	8		3.7500
Sig.		.085	.080

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

PRESSCHO

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05
		1
3.00	34	2.7647
7.00	29	2.8621
1.00	8	3.1250
2.00	15	3.1333
4.00	8	3.2500
6.00	17	3.5882
5.00	11	3.8182
Sig.		.386

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

COMPRES

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05
		1
7.00	29	1.7931
2.00	15	1.8000
5.00	11	1.8182
1.00	8	2.0000
3.00	34	2.0000
4.00	8	2.5000
6.00	17	2.5294
Sig.		.883

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

PRESCOAC

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05
		1
2.00	15	2.0667
3.00	34	2.1176
4.00	8	2.1250
1.00	8	2.3750
7.00	29	2.4483
5.00	11	3.1818
6.00	17	3.2941
Sig.		.210

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

BODYIMAG

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05
		1
2.00	15	1.9333
1.00	8	2.1250
3.00	34	2.6765
5.00	11	2.8182
7.00	29	2.8276
6.00	17	2.9412
4.00	8	3.5000
Sig.		.108

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

SOCPRESS

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05
		1
5.00	11	2.4545
2.00	15	3.2000
6.00	17	3.2353
7.00	29	3.2414
1.00	8	3.3750
3.00	34	3.3824
4.00	8	3.7500
Sig.		.283

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

COMPLEV

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05	
		1	2
7.00	29	1.6207	
5.00	11	1.6364	
2.00	15	1.9333	
4.00	8	2.0000	
3.00	34	2.2941	2.2941
6.00	17	2.8235	2.8235
1.00	8		3.6250
Sig.		.308	.192

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

CURIOUS

Scheffe[a,b]

SCHOOL	N	Subset for alpha = .05
		1
7.00	29	2.6207
1.00	8	3.0000
4.00	8	3.2500
3.00	34	3.4706
6.00	17	3.7647
2.00	15	3.8000
5.00	11	3.8182
Sig.		.371

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 13.200.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Scheffe for Grouping by Sport.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
PRESSWIN	Between Groups	1.498	5	.300	.235	.946
	Within Groups	147.978	116	1.276		
	Total	149.475	121			
PRESTEAM	Between Groups	12.993	5	2.599	2.352	.045
	Within Groups	128.187	116	1.105		
	Total	141.180	121			
PRESSCHO	Between Groups	8.293	5	1.659	1.389	.234
	Within Groups	138.527	116	1.194		
	Total	146.820	121			
COMPRES	Between Groups	4.347	5	.869	.561	.729
	Within Groups	179.620	116	1.548		
	Total	183.967	121			
PRESCOAC	Between Groups	14.686	5	2.937	2.371	.043
	Within Groups	143.683	116	1.239		
	Total	158.369	121			
BODYIMAG	Between Groups	18.203	5	3.641	2.428	.039
	Within Groups	173.961	116	1.500		
	Total	192.164	121			
SOCPRESS	Between Groups	8.290	5	1.658	1.129	.349
	Within Groups	170.333	116	1.468		
	Total	178.623	121			
COMPLEV	Between Groups	27.735	5	5.547	3.981	.002
	Within Groups	161.650	116	1.394		
	Total	189.385	121			
CURIOUS	Between Groups	16.707	5	3.341	2.221	.057
	Within Groups	174.514	116	1.504		
	Total	191.221	121			

Multiple Comparisons

Scheffe

Dependent Variable	(I) SPORT	(J) SPORT	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
PRESSWIN	1.00	2.00	5.833E-02	.4945	1.000	-1.6158	1.7324
		3.00	.2361	.4334	.998	-1.2311	1.7033
		4.00	.2159	.5248	.999	-1.5609	1.9927
		5.00	.3523	.4663	.989	-1.2265	1.9310
		6.00	7.738E-02	.4663	1.000	-1.5114	1.6661
	2.00	1.00	-5.8333E-02	.4945	1.000	-1.7324	1.6158
		3.00	.1778	.3367	.998	-.9623	1.3179
		4.00	.1576	.4483	1.000	-1.3604	1.6755
		5.00	.2939	.3782	.998	-.9865	1.5744
		6.00	1.905E-02	.3818	1.000	-1.2737	1.3118
	3.00	1.00	-.2361	.4334	.998	-1.7033	1.2311
		2.00	-.1776	.3367	.998	-1.3179	.9623
		4.00	-2.0202E-02	.3799	1.000	-1.3064	1.2660
		5.00	.1162	.2938	.999	-.8796	1.1109
		6.00	-.1567	.2985	.998	-1.1683	.8518
	4.00	1.00	-.2159	.5248	.999	-1.9927	1.5609
		2.00	-.1576	.4483	1.000	-1.6755	1.3604
		3.00	2.020E-02	.3799	1.000	-1.2660	1.3064
		5.00	.1364	.4171	1.000	-1.2757	1.5484
		6.00	-.1365	.4204	1.000	-1.5618	1.2947
	5.00	1.00	-.3523	.4663	.989	-1.9310	1.2265
		2.00	-.2939	.3782	.998	-1.5744	.9865
		3.00	-.1162	.2938	.999	-1.1109	.8796
		4.00	-.1364	.4171	1.000	-1.5484	1.2757
		6.00	-.2749	.3448	.998	-1.4415	.8917
	6.00	1.00	-7.7381E-02	.4663	1.000	-1.6661	1.5114
		2.00	-1.9048E-02	.3818	1.000	-1.3118	1.2737
		3.00	.1567	.2985	.998	-.8518	1.1683
		4.00	.1365	.4204	1.000	-1.2947	1.5618
		5.00	.2749	.3448	.998	-.8917	1.4415
PRESTEAM	1.00	2.00	-.1500	.4802	1.000	-1.7081	1.4081
		3.00	-.9722	.4033	.332	-2.3378	.3934
		4.00	-.8316	.4885	.804	-2.5856	7119
		5.00	-.5227	.4340	.918	-1.9921	.9467
		6.00	-.8548	.4368	.813	-2.1335	.4239
	2.00	1.00	.1500	.4802	1.000	-1.4081	1.7081
		3.00	-.8222	.3134	.236	-1.8833	.2389
		4.00	-.7818	.4173	.623	-2.1948	.6310
		5.00	-.3727	.3520	.851	-1.5645	.8190
		6.00	-.7048	.3554	.646	-1.7079	.3984
	3.00	1.00	.9722	.4033	.332	-.3934	2.3378
		2.00	.8222	.3134	.236	-.2389	1.8833
		4.00	4.040E-02	.3536	1.000	-1.1567	1.2375
		5.00	.4495	.2735	.745	-.4764	1.3754
		6.00	.3175	.2778	.933	-.4231	1.2580
	4.00	1.00	.8316	.4885	.804	-.7119	2.5856
		2.00	.7818	.4173	.623	-.6310	2.1948
		3.00	-4.0404E-02	.3536	1.000	-1.2375	1.1567
		5.00	.4091	.3862	.952	-.9052	1.7234
		6.00	.2771	.3813	.982	-1.0476	1.6017
	5.00	1.00	.5227	.4340	.918	-.9467	1.9921
		2.00	.3727	.3520	.851	-.8190	1.5645
		3.00	-.4495	.2735	.745	-1.3754	.4764
		4.00	-.4091	.3862	.952	-1.7234	.9052
		6.00	-.1320	.3207	.999	-1.2178	.9538
	6.00	1.00	.8548	.4368	.813	-.4239	2.1335
		2.00	.7048	.3554	.646	-.3984	1.7079
		3.00	-.3175	.2778	.933	-1.2580	.6231
		4.00	-.2771	.3813	.982	-1.6017	1.0476
		5.00	.1320	.3207	.999	-.9538	1.2178
PRESSCHO	1.00	2.00	-8.3333E-03	.4784	1.000	-1.6281	1.6114
		3.00	-8.3333E-03	.4193	1.000	-1.4279	1.4113
		4.00	-.8932	.5078	.898	-2.4123	1.0260
		5.00	.3068	.4512	.993	-1.2297	1.8343
		6.00	.2202	.4540	.998	-1.3169	1.7574
	2.00	1.00	8.333E-03	.4784	1.000	-1.6114	1.6281
		3.00	.0000	.3256	1.000	-1.1031	1.1031
		4.00	-.8848	.4338	.777	-2.1535	.7838
		5.00	.3152	.3459	.990	-.8237	1.5540
		6.00	.2286	.3694	.996	-1.0222	1.4793
	3.00	1.00	8.333E-03	.4193	1.000	-1.4113	1.4279
		2.00	.0000	.3256	1.000	-1.1031	1.1031
		4.00	-.8848	.3676	.829	-1.9293	.5596
		5.00	.3152	.2843	.941	-.5473	1.2776
		6.00	.2286	.2866	.988	-.7492	1.2063
	4.00	1.00	.8932	.5078	.898	-1.0260	2.4123
		2.00	.8848	.4338	.777	-.7838	2.1535
		3.00	.8848	.3676	.829	-.5596	1.9293
		5.00	1.0000	.4035	.300	-.3662	2.3662
		6.00	.8134	.4067	.416	-.4636	2.2905
	5.00	1.00	-.3068	.4512	.993	-1.8343	1.2297
		2.00	-.3152	.3459	.990	-1.5540	.8237
		3.00	-.3152	.2843	.941	-1.2776	.5473
		4.00	-1.0000	.4035	.300	-2.3662	.3662
		6.00	-8.6580E-02	.3334	1.000	-1.2153	1.0422
	6.00	1.00	-.2202	.4540	.998	-1.7574	1.3169
		2.00	-.2286	.3694	.996	-1.4793	1.0222
		3.00	-.2286	.2866	.988	-1.2063	.7492
		4.00	-.9134	.4067	.416	-2.2905	.4636
		5.00	8.658E-02	.3334	1.000	-1.0422	1.2153
COMPRES	1.00	2.00	.2000	.5448	1.000	-1.6444	2.0444
		3.00	-.2444	.4775	.998	-1.8609	1.3721
		4.00	.1818	.5782	1.000	-1.7758	2.1394
		5.00	.1818	.5136	1.000	-1.5576	1.9212
		6.00	.0000	.5170	1.000	-1.7504	1.7504
	2.00	1.00	-.2000	.5448	1.000	-2.0444	1.6444
		3.00	-.4444	.3710	.919	-1.7005	.8116
		4.00	-2.1818E-02	.4940	1.000	-1.6906	1.6542
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		6.00	-.2000	.4207	.999	-1.6242	1.2242
	3.00	1.00	.2444	.4775	.998	-1.3721	1.8609
		2.00	.4444	.3710	.919	-.8116	1.7005
		4.00	.4263	.4185	.959	-.9908	1.8433
		5.00					